AIR IN VET

Applied Innovation and Research in Vocational Education and Training

# REPORT OF THE INTERVENTIONS, THE EXPERIENCES WITH THEIR ADAPTATION AND A SET OF RECOMMENDATIONS FROM THE AIRINVET PROJECT

Deliverable 5.2: Ready to use modules for embedding Applied Research in VET

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# PUBLISHABLE EXECUTIVE SUMMARY

This report builds on the groundwork established in the Applied Innovation and Research in Vocational Education and Training (AIRinVET) project, offering an in-depth exploration of the practical tools, frameworks, and methodologies developed to enhance applied research within Vocational Education and Training (VET) settings. The report highlights the efforts among consortium members — BHH, EURASHE, ISSO, KATAPULT, NBCC, TKNIKA, IMH and AFM — to produce actionable resources in the form of ready-to-use learning modules that introduce and facilitate the integration of applied research into institutional, regional and national VET contexts.

The document focuses on translating the project's conceptual and intervention-based insights into a comprehensive guide for stakeholders, including VET institutions, SMEs, policymakers, and educators. These resources address the VET ecosystem's diverse needs, offering solutions ranging from frameworks for stakeholder engagement and funding strategies to tools for measuring the local impact of applied research initiatives. By emphasizing replicability and adaptability, this report provides stakeholders with the means to independently implement applied research practices tailored to their unique needs.

Key outputs presented in this deliverable include models for fostering collaborations between VET and Universities of Applied Sciences, the model of Public-Private Partnerships, strategies for integrating research into VET curricula, and tools for aligning institutional research efforts with regional development priorities. Additionally, it offers practical examples, such as the presentation of the Basque model and other methodologies for capacity building, knowledge transfer, and collaborative innovation, leveraging the expertise and real-world applications demonstrated by consortium members throughout the project.

This report is intended as a bridge between the project's overarching goals and its practical implications, serving as a resource for those committed to advancing the role of VET in research and innovation ecosystems. The findings and tools presented here address current challenges and lay the groundwork for a more cohesive and impactful approach to applied research in VET across Europe.

# LIST OF ACRONYMS AND ABBREVIATIONS

In this report, we use the following acronyms and definitions as described in our glossary.

Some additional abbreviations explanations can be found below:

| | |
|---|---|
| AIRinVET | Applied and Innovation Research in Vocational Education and Training |
| HEIs | Higher Education Institutions |
| PHE | Professional Higher Education |
| PPP | Public-Private Partnership |
| SMEs | Small and Medium Enterprises |
| R&I | Research and Innovation |
| RTOS | Research and Technology Organisations |
| UAS | University of Applied Sciences |
| VET | Vocational Education and Training |
| WPA | Work Process Analysis |

# CONTENT

# INTRODUCTION

The AIRinVET project aims to enhance the integration of applied research within Europe's Vocational Education and Training (VET) sector. Applied research is crucial in bridging the gap between theoretical learning and real-world practice, especially within VET contexts where the goal is to equip learners with practical, industry-relevant skills. However, VET institutions often face challenges in implementing applied research, from limited resources and funding to a lack of established collaborative frameworks that engage industry, government, and education partners. One of the activities carried out within the AIRinVET project was to address these gaps by developing structured examples of training sessions, which can inspire both local change-makers in VET institutions and decision-makers at systemic level. In this publication, the project partners propose five interventions, stemming from TKNIKA, IMH, AFM, EURASHE, BHH, NBCC, and KATAPULT experience. The "interventions" themselves can also be referred to as a learning modules – "ready to implement" session scenarios, which could serve as a basis to introduce topic to the local context of VET centres, workshops for policy-makers, or a joint meeting between education and business stakeholders.

The interventions, conducted in 2024, served as platforms for piloting innovative research frameworks and building connections between VET institutions and industry partners. They highlighted different approaches to applied research, showcasing various models and best practices that could be adapted across countries and regions. **This publication aims to provide users with ready-to-go intervention models tackling five aspects relevant for the implementation of the framework for applied research in various contexts.**

The five main activities — ranging from TKNIKA's TKGUNE experience to BHH's model for curriculum design — reflect the project's comprehensive approach to applied research in VET. Each intervention tackled a unique aspect of applied research and collaboration, such as curriculum alignment with industry needs, development of Public-Private Partnerships (PPP), and frameworks for student participation in research activities. This introduction provides a foundation for understanding the range of topics addressed by the interventions and the collaborative spirit underlying the project. It outlines the timeline of these interventions, underscoring the structured, phased approach taken by the AIRinVET consortium.

**Five interventions which you will find in this publication**

The interventions were organised sequentially between March and June 2024, each aligned with the expertise of the respective consortium members. In this publication, you will find five module curricula which also include the scope, resources needed, planning support and the module curricula. Additionally, you will find the tentative success indicators as well as the SWOT analysis of each intervention. It is important to notice that each of the modules can and should be adapted to the local context and needs of the organisers.

Each intervention can be organised as a standalone module. The order of intervention appearance in this publication goes from the holistic approach to the idea of VET-university collaboration, through the Public-Private Partnerships model and the regional example of the Basque Country, to the tailored approaches to experiential learning and curricula design.

Each intervention contributes to a broader understanding of how applied research can be effectively embedded within VET institutions, creating replicable models for other contexts. This report offers an overview of each intervention and presents key takeaways that can support stakeholders in expanding applied research efforts across VET networks. The timeline of the interventions does not determine the order of the interventions described in the further chapters in this publication. The structure of the following chapters moves from broad, universal approaches to national examples, eventually focusing on specific areas such as curriculum design and student involvement in applied research.

# INTRODUCTION TO THE INTERVENTION DESCRIPTIONS

The consortium partners identified the need to establish a common methodological approach to ensure a unified understanding and assessment of each intervention. This methodology serves as a structured framework to address key challenges tackled by each intervention. By leveraging current policies, industry reports, and educational trends, the approach emphasizes the critical importance of fostering collaboration between SMEs and VET centres, integrating applied research into educational practices, and promoting innovation-driven solutions.

The primary objectives include enhancing the employability of VET students, improving institutional capacities to align curricula with industry needs, and creating sustainable partnerships and regional systems which support the VET ecosystem as a whole. Each intervention's unique value lies in its ability to bridge knowledge gaps, drive collaboration, and support systemic innovation within the VET ecosystem. The following sections outline the methodology's key components:

- **Introduction** - The introduction explains the needs and importance of the topic, supported by evidence from reports, policies, and trends. It identifies challenges that the intervention seeks to address and highlights its relevance in the current ecosystem. This part focuses on contextual importance, main goals, and the intervention's unique value.

- **Description of the Interventions** - This section outlines the structure of the intervention, including its objectives and core content. It provides a detailed explanation of the methodologies applied and key takeaways from the actual activities which took place within the AIRinVET project, such as lectures, discussions, and workshops. Emphasis is placed on the intervention's relevance and the alignment of its outcomes with identified needs.

- **Organisational Part** - This part describes the preparatory steps necessary for implementing the intervention. It includes logistical planning, such as securing venues, organising speakers, preparing materials, and ensuring stakeholder engagement. Additionally, it defines roles and resources needed for effective execution.

- **Curricula** - The curriculum is designed to ensure consistency and replicability of the intervention. It includes:
  - Educational profiles or prerequisites for participants.
  - Target group specification.
  - Qualifications and expertise required of the lecturers.
  - Objectives, knowledge, skills, and competencies developed during the intervention.
  - The content, teaching methods, and relevant literature used in the intervention.

- **Indicators** - Key indicators measure the success and impact of the intervention. These are divided into: Organisational Indicators, Educational Indicators, Business Indicators.

# INTERVENTION: ADAPTING RESEARCH AND TECHNOLOGY ORGANISATIONS (RTOS) AND UNIVERSITIES APPROACHES TO VET CONTEXTS - EURASHE

## 1. Introduction

The implementation of practical knowledge management tools is a critical component in fostering innovative solutions. For higher education institutions, it is essential to understand their role within the broader ecosystem and to facilitate the creation of collaborative, interdisciplinary teams that support the development of new solutions. These efforts can significantly enhance local, regional, and national competitiveness. Therefore, showcasing practical tools and mechanisms is essential to highlight best practices and address the challenges inherent to collaborative initiatives.

The intervention aimed to encourage all higher education institutions, regardless of size and scope, to integrate VET centres and similar Professional Higher Education (PHE) Institutions into the research and innovation environment and to encourage VET centres to participate in the research and innovation (R&I) environment, as this integration is mutually beneficial.

The benefits of this integration of VET centres were outlined, and participants were introduced to alternative ways of looking at R&I environments beyond the traditional collaborations between Fundamental Research Universities, private businesses, and governments. The training also gave participants the necessary skills to integrate various stakeholders in the R&I environment.

## 2. Description of the Interventions

The sessions focused on strengthening regional engagement through strategic partnerships and fostering a deeper understanding of the local innovation ecosystem. Additionally, they aimed to address the evolving dynamics of open access to research results and data, examining its implications for the dissemination and application of knowledge within Research and Technology Organisations (RTOs) and universities.

During the first session, the focus was on traditional R&I environments, also known as the "knowledge triangle". Participants learned about the R&I landscape and the roles of each stakeholder (Research & technology, businesses, Education) within this landscape. John Edwards, Secretary General of EURASHE, emphasised the importance of cooperation between different types of institutions to foster innovation. He positioned VET centres within the R&I landscape and illustrated the local and regional dimensions of R&I for the participants.

In the second, third and fourth sessions, the focus was on introducing the participants to RECAPHE. RECAPHE is a collaborative process aimed at creating tools to improve the research and innovation capacity in PHE. Participants were taught how this tool is developed in order to understand its significance. They were also informed about the RECAPHE Competence Framework for PHE, highlighting the differences from the Competence Framework developed by the European Commission. This was important to offer participants an alternative perspective on their institutions' researchers' skills. The RECAPHE Competence Framework has been specifically designed for PHE Institutions, unlike the European Commission framework. It was crucial to familiarise participants with the Framework to help them identify VET centres and PHE Institutions in the R&I environment more easily. Later the focus was on the skills that project participants need to acquire to successfully integrate with other R&I environment stakeholders. The session introduced the various roles of project team members and highlighted that each of them has different responsibilities. Furthermore, it showed how effective communication can enhance collaboration between stakeholders. This session also introduced participants to methods for enhancing project sustainability to maximise their impact.

The fifth session focused on the regional impact of research. During this session, UASiMAP was introduced to the participants. UASiMAP is a self-reflection tool measuring local engagement of Universities of Applied Sciences (UAS). Participants were invited to conduct a self-reflection of their UAS's local engagement. During the event, John Edwards introduced the concept of Smart Specialisation to the participants. Drawing from his experience at the European Commission's Joint Research Centre, he provided valuable insights into the benefits of smart specialisation for individual institutions, regions, and the entire European Union. The session also highlighted the role of VET centres in identifying trends and strengths within the region.

The intervention employed a combined methodology that included a good practices assessment and case study analysis:

1. **Assessment of Good Practices and Challenges**: The role of higher education institutions in fostering the creation of a Research Community was evaluated. The assessment highlighted the importance of addressing challenges and enhancing practice competencies.
2. **Case Study Analysis of Competence Research**: This analysis utilised the RECAPHE Competence Framework for Professional Higher Education and the UASiMAP self-reflection tool. The study showcased practical tools that were subsequently implemented to strengthen competence frameworks and institutional practices.

The following recommendations were drafted based on the activities outlined in the intervention activities. These recommendations are meant at both regional and European levels and are aimed at improving the applied research in vocational training ecosystem:

1. **Integration of VET Centres and PHE in local R&I environment**: VET centres and PHE Institutions play a crucial role in the R&I ecosystem. They are the connectors between various stakeholders engaged in the R&I process, such as businesses, private firms, society and higher education.
2. **Consultation of VET centres by regions and governments to determine their strengths in the context of Smart specialisation**: VET centres and PHE Institutions can identify trends and strengths in the region and can aid the local government in determining their relative strengths.
3. **VET centres and PHE Institutions employ tools such as the RECAPHE Research Competence Framework and UASiMAP**: these tools aid in identifying engagement activities and contributions made by PHE and VET Institutions to their regions.

## 2.1. Timetable

| | |
|---|---|
| 10:10 - 11:45 | EURASHE Research Community of Practice. Research competences and strategies:<br>• Why should applied HEIs engage in Research? John Edwards, EURASHE Secretary General<br>• What competences do researchers need? Ruth Moran, Atlantic Technological University, Ireland, and Nijolė Zinkevičienė, Vilniaus kolegija, Lithuania |
| 12:00 - 13:00 | Practical session on researchers' competencies (based on RECAPHE materials). Ruth Moran, Atlantic Technological University, Ireland, and Nijolė Zinkevičienė, Vilniaus kolegija, Lithuania<br>RECAPHE: perspectives for the future. Prof. Marek Frankowicz, Jegiellonian University, Poland, Q&A |
| 14:00 - 16:00 | EURASHE Research Community of Practice. Local and regional impact of research – strategies and public policies, John Edwards, EURASHE Secretary General |

## 2.2. Speakers

**Dr John Edwards** is the Secretary General of EURASHE, the European Association of Institutions in Higher Education in Brussels. He has a background in economic geography, regional development and governance, with a focus on EU innovation and cohesion policies. Between 2011 and 2020, Dr Edwards worked for the European Commission's Joint Research Centre, leading projects on the role of higher education and vocational excellence in the design and implementation of smart specialisation strategies. To get in touch about this intervention, you can email him at: john.edwards@eurashe.eu.

**Ruth Moran** is a seasoned professional in Learning and Development, with extensive experience spanning multiple industries. She is the founder of CIRIT, a collaborative initiative of seven Higher Education Institutions in Ireland, delivering Research Integrity training at a national level. Ruth specialises in the development, delivery, and implementation of leadership, coaching, and educational programs across diverse sectors. Currently based at Atlantic Technological University, she brings a wealth of expertise in fostering innovation and excellence in education and training.

**Dr. Nijole Zinkeviciene** is currently working at Vilniaus kolegija/University of Applied Sciences, the largest and leading professional higher education institution in Lithuania in the position of Vice-Rector for Research and Partnerships.

**Prof. Marek Frankowicz** is a theoretical chemist at the Jagiellonian University in Kraków, Poland, affiliated with the Department of Theoretical Chemistry at the Faculty of Chemistry. He specialises in the theory of complex systems and self-organisation. Dr. Frankowicz has completed international research fellowships in Belgium and Japan, and he held a two-year teaching contract at Pierre and Marie Curie University in Paris. As expert in higher education, he is a member of the Bologna Process Experts Team, a coordinator of numerous international projects, and serves as an external expert in international accreditation processes. Dr. Frankowicz is the Vice-Chair of the Sectoral Council for Competences in the Chemical Sector and a member of the EURASHE Committee for Strategic Advice. He is also the organiser of the Regional Expert Centre for Education for Sustainable Development in Southern Poland.

## 2.3. Summary

**Strengths**

The intervention showcases the significant advantages of integrating VET centres into local and regional R&I ecosystems. By leveraging their applied focus and regional connections, VET centres can address specific local needs while contributing to broader innovation goals. Tools like RECAPHE and UASiMAP equip these institutions with frameworks for competency-building and self-reflection, enabling effective engagement with diverse stakeholders. The intervention aligns with EU priorities, such as the Green Deal and smart specialisation strategies, reinforcing the relevance of VET centres in regional development. Additionally, many PHE institutions and VET centres already possess the infrastructure and readiness to support applied research activities, positioning them as vital actors in fostering innovation.

**Weaknesses**

Despite the intervention's potential, several barriers and challenges remain. Limited awareness of VET centres' roles in R&I ecosystems among policymakers and industries hinders their integration. Many VET centres face funding constraints and lack incentives to support applied research initiatives. Furthermore, academic and VET staff often lack training in research project management, stakeholder integration, and the effective use of tools like UASiMAP and RECAPHE. Current VET strategies predominantly focus on training rather than fostering research collaborations, creating gaps in policy support. To maximise impact, the intervention requires improved alignment with regional development priorities and a stronger focus on sustainability and long-term outcomes.

**Opportunities**

The intervention aligns well with emerging policy trends, such as the growing emphasis on applied research in EU initiatives and the green and digital transitions. These trends create opportunities for increased funding and policy support, particularly through programmes like Erasmus+ and Horizon Europe. Rising demand for skilled professionals trained through research-oriented education further underscores the relevance of this approach. By showcasing success stories and enhancing advocacy, VET centres can position themselves as indispensable partners in R&I ecosystems. Additionally, addressing identified weaknesses, such as skills gaps, through targeted training programmes can transform challenges into opportunities and strengthen the overall impact of the intervention.

**Threats**

The intervention faces several external threats that could hinder its success. Traditional academic institutions often dominate R&I discussions, potentially sidelining the contributions of VET centres. Industry stakeholders unfamiliar with the capabilities of VET institutions may be hesitant to engage in collaborations. Furthermore, VET centres might face unexpected demands for advanced facilities or expertise beyond their current capacity, creating implementation challenges. Diverging priorities between SMEs and educational institutions can complicate partnerships, while fragmented policies at regional and national levels may lead to inconsistent support for VET centres. Ensuring that tools like RECAPHE and UASiMAP are adapted to local contexts will be crucial to overcoming these obstacles and maintaining the intervention's relevance.

# 3. How to Prepare the Intervention

For the preparation of the intervention is given attention to three different perspectives, the organisational, educational and business perspective.

## 3.1. Organisational Perspective

To organise the intervention, the following key questions are helpful.

**When should you start preparing the intervention and with which activities?**

In the case of this intervention which aims to set the platform for the collaboration and dialogue between RTOs, Universities of Applied Sciences, VET centres and other relevant actors the principle is to approach the preparatory process in the inclusive and constructive manner. The right time can only be defined when we are certain who do want to involve, what our aims are and being aware of the current situation. It is advisable to commit enough time before organising the intervention to carry on thorough assessment of needs before moving into direct organisation phase.

- **Needs Assessment**
  - Gathering, reviewing and analysing current and relevant literature to validate and address gaps
  - Documenting findings and sharing with event content team
  - Finding best practices on the VET-UAS collaboration in the relevant region or country
  - Redesigning the model or models for the European VET institutions and validating if required
  - Providing the ready-to-use tools for embedding the Applied Research in the institutions
- **Design**
  - Determining the high-level training outcomes
  - Determining the structure, approach, methods and timing for the training
  - Defining the learning objectives and target audience for the training
  - Drafting and sharing high-level programme outline with project team
- **Development**
  - Building the training content (session can be organised as a sub-stream within the local event, conference)
  - Creating teaching presentations materials and visuals
  - Developing learning activities
  - Developing programme evaluation
  - Recruiting and registering participants
- **Delivery**
  - Finalising training agenda
  - Organising practical details
  - Contacting participants - send pre-readings and Teams link (if the event is organised in person, liaise with local organisers on the final arrangements)
  - Delivering two hybrid sessions

- **Evaluation**
  - Conducting evaluation of programme content, delivery and outcomes
  - Summarising and sharing results with project team
  - Following up with participants on optional assignment as applicable

**How many people should be involved in the preparation of the intervention?**

- The workshop must be led by a minimum of two trainers capable of presenting the overall topic and the specific tools to the audience.

**From which backgrounds should the people involved come?**

- Facilitators should understand the modalities of the VET and applied science Universities settings. The collaboration between the sectors is often restricted by the system-level obstacles, therefore people involved should possess this experience on overcoming the barriers in those areas.

**What are the key resources you need to provide the workshop?**

- MS Teams (or other videoconferencing platform); PowerPoint; Poll Everywhere (polling application). If the session is in-person or hybrid, a standard classroom setting with projector will do.

**How should the "to-do" list look like before the workshop?**

- Set a date and venue
- Secure speakers and facilitators
- Confirm technology setup
- Create a registration system
- Finalise the agenda
- Engage and invite stakeholders
- Share the tools with the participants after the training

## 3.2. Educational perspective:

To ensure the intervention's success from an educational standpoint, it is crucial to identify speakers whose expertise aligns with the intervention's core objectives. This can be achieved by leveraging professional networks, past collaborations, and relevant organisations to find individuals with proven experience in applied research, regional innovation, and stakeholder engagement. Once speakers are identified, conducting a gap assessment is essential to determine the specific needs and challenges related to the intervention topic. This process can include stakeholder surveys, literature reviews, and workshops to uncover gaps in knowledge or practices, ensuring the intervention is targeted and impactful. The main educational value for participants should lie in practical skill-building, actionable strategies, and the application of tools like RECAPHE and UASiMAP. By fostering peer learning and providing frameworks for engagement, participants can directly enhance their role within research and innovation ecosystems.

## 3.3. Business perspective

Engaging the business community effectively requires a tailored approach that highlights the mutual benefits of participation. Personalised invitations, emphasising the intervention's relevance to business goals such as innovation, workforce development, and regional growth, can attract representatives from the business sector. Potential participants can be identified through industry associations, regional innovation clusters, chambers of commerce, and networking events like trade fairs or innovation forums. To further appeal to businesses, it is essential to underscore the practical outcomes of the intervention, such as access to tools and frameworks that enhance operations, opportunities for strategic partnerships, and solutions to industry-specific challenges. It is necessary to remember that the language and the value communication differs between the education and business sectors. While tailoring the message, it is crucial to not disincentivise the business actors by using the specific jargon used in Higher Education. By aligning the intervention's objectives with the priorities of the business environment, representatives will see clear value in participating, fostering stronger collaboration between academia and industry.

# 4. Curriculum for Intervention Workshop

## 4.1. Education Profile

No specific qualifications are required to participate.

## 4.2. Target Group

- Teachers and trainers
- Curriculum developers and instructional designers
- Academic leaders and managers
- Researchers
- Research administrators and managers
- Project officers
- Policy advisors

## 4.3. Speaker Profile

The speakers should possess knowledge, skills, and competencies related to research and innovation ecosystems, as well as the processes involved in fostering innovation within Higher Education Institutions (HEIs) and VET centres.

## 4.4. Intervention Objectives

- Acquire knowledge to facilitate collaboration between VET centres and HEIs in developing innovative solutions.
- Gain a comprehensive understanding of the open innovation concept and regional engagement tools.
- Understand the importance of engaging diverse stakeholders in the R&I environment.

## 4.5. Knowledge

- Understands the current trends and implications of open access for research results and data, including the challenges and opportunities it presents for knowledge dissemination.
- Describes how applied research serves as a form of experiential and work-integrated learning.
- Recognises how open research principles can be adapted and applied within vocational education and training (VET) to enhance the relevance, accessibility, and application of research findings in these settings.
- Understands HEIs and VET programmes to identify and build partnerships within their cities and regions.
- Demonstrates an understanding of the concept of Regional Innovation Strategies.

## 4.6. Skills

- Adapts different types of knowledge (e.g., theoretical, practical, tacit) and apply them effectively in the context of applied research within VET.
- Engages stakeholders, including industry partners, government, and the community, in the research process to ensure relevant and impactful outcomes.
- Develops strategies for publishing research findings in accessible formats and promote these findings through various channels to maximise their impact.
- Aligns regional needs with innovative activities in VET and HEIs.

## 4.7. Competences

- Design and coordinate innovative research projects that align with regional needs.
- Implement methods to identify and establish collaborations within cities and regions, fostering synergy between academia, industry, and government.
- Lead initiatives to effectively communicate research results to broader audiences, ensuring the generated knowledge has tangible societal impacts and advances VET practices.

### 4.8. Intervention Content

- Explore the role of building a Research Community of Practice, as well as develop research competencies and strategies.
- Assess good practices for establishing effective mechanisms to support competency development.
- Provide an overview of the local and regional impact of research in fostering collaboration between HEIs and VET centres.

### 4.9. Teaching Methods

- Self-Assessment Tools – Designed to highlight engagement activities and contributions to regional development, particularly in the context of research advancement and tool creation.
- Case Studies – Demonstrate how applied research projects can address specific business needs effectively.
- Presentations – Offer a structured framework and essential foundational knowledge to enhance collaboration between VET centres and HEIs.

### 4.10. Literature

1. Power Point Presentations
2. UASIMAP for self-reflection tool: https://uasimap.knowledgeinnovation.eu
3. Recaphe Tool: https://recaphe.eu/

## 5. Key indicators

To assess the impact of the intervention, the following KPIs can be monitored.

Organisational (Intervention)

- Number of companies participating in the session.
- Number of VET centres and Universities of Applied Sciences participating in the session.
- Number of local authorities informed and attending the session.
- Number of registered participants.

Educational

- The number of collaborations established between the VET centres, UAS, and other actors, such as businesses and local authorities, in your region.
- Number of new users of the presented tools during the presentations.
- Number of programmes which involved the learning outcomes based on the established collaborations in the VET / UAS curricula.
- Number of applied research introduced by VET centres.

Business

- Percentage of training provided by VET centres to SMEs in your region compared to the total number of SMEs.
- Percentage of services for SMEs developed by VET centres in your region compared to the total services used by SMEs.
- Number of patents developed between SMEs and VET centres.
- Number of grants related to the development of collaboration between VET centres and SMEs.
- Number of strategies related to the development of collaboration between VET centres and SMEs.

## 6. Annexes

1. Dr John Edwards, Why should Higher Education Institutions engage in Research & Innovation? - for the consulations and the presentations on the topic feel free to reachout to EURASHE at eurashe@eurashe.eu
2. Dr. Nijolė Zinkevičienė, Ruth Moran, RECAPHE: a cooperative process to develop tools for enhancing staff research and innovation capacity in Professional Higher Education - for the consulations and the presentations on the topic feel free to reachout to EURASHE at eurashe@eurashe.eu
3. UASIMAP for self-reflection tool, https://uasimap.knowledgeinnovation.eu

# INTERVENTION: ADVANCING THE PUBLIC-PRIVATE PARTNERSHIPS (PPPS) APPROACH – EXTRAPOLATING KATAPULT'S EXPERIENCE

## 1. Introduction

Effective mechanisms of collaboration between different stakeholders are a crucial component in developing innovative and entrepreneurial approaches of collaboration between VET centres and SMEs. One form of this collaboration is the Public-Private Partnership (PPP) approach, a common model in the Netherlands. Katapult, an organisation supporting these public-private partnerships, plays a key role in developing, maintaining, and assessing these collaborations. In its network there are over 550 PPPs, 134.000 students, 21.000 companies and 19.000 teachers and researchers. Together, they form the fundament of the knowledge and skills that are so very needed in our current society.

A critical success factor in Katapult's operations is the partnership between government, education, and industry, with each sector fulfilling its unique role.

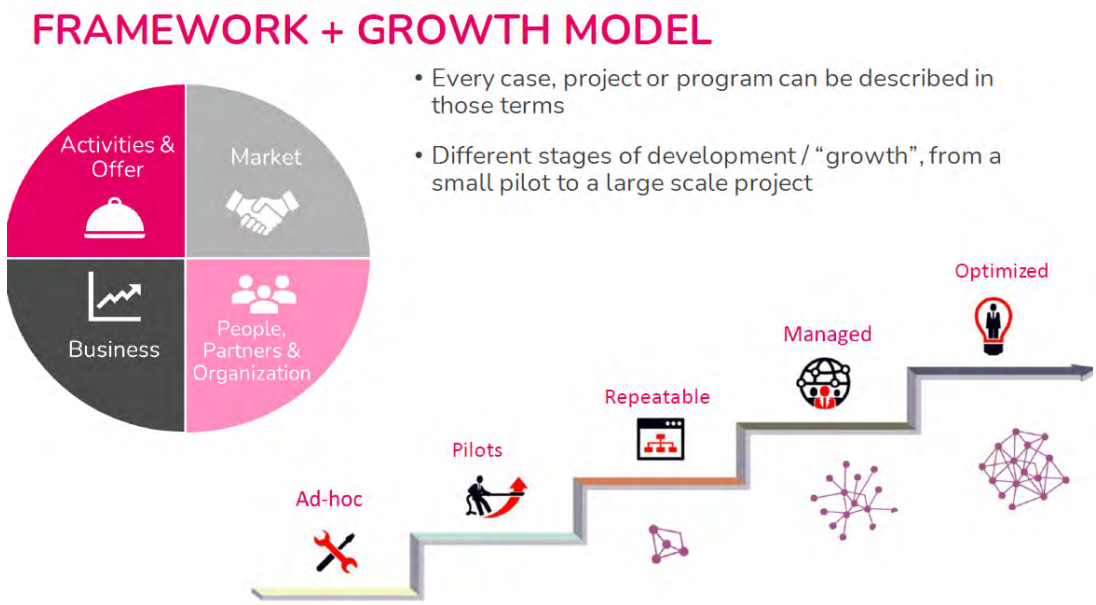


Figure 1 - 4 Dimensions Model Katapult

The intervention aimed to showcase the Dutch experience with implementing the PPP approach and explore the possibility of transferring this collaborative model to other regions.

The key added value lies in assessing the challenges, barriers, and possibilities of implementing PPPs in different regions and countries. This approach facilitates the transferability of the PPP model, leading to a set of tailored recommendations and a potential growth model. Additionally, a broader European perspective on developing the PPP model was also included.

## 2. Description of the Interventions

The intervention consisted of two parts. The first part focused on the theoretical approach to PPP collaboration, based on a model developed over the past 10 years by Katapult. The second part explored the potential for implementing Dutch examples in Germany, the Basque Country, and from a broader European perspective.

The first part of the workshop was more theoretical, providing a general background on PPPs. The first presentation, titled "PPP Approach in the Netherlands: PPPs and Applied Research," aimed to describe the implementation of collaboration management methodologies based on business entities, activities and offerings, market conditions, and partner organisations.

The second presentation, "Doing Applied Research: Cooperation within a PPP from the VET Perspective," presented a practical case of collaboration development within VET centres and their day-to-day practices.

The final theoretical presentation, "Funding of Applied Innovation and Research within PPPs," highlighted the role of regional support and showcased examples of funding for PPP initiatives. This presentation also introduced the "Innovation-Working-Learning" approach, a key component of the Katapult model. In the final part, participants were tasked with assessing the feasibility of implementing the PPP approach in Canada, Germany, the Basque Country, and from a broader European perspective.

The second part of the intervention started from the presentation of the AIRinVET Partners. In the Basque Country, TKNIKA, IMH, and AFM identified bureaucracy and technical capacity as the main constraints to PPPs. They recommended making regulations more flexible, offering financial incentives, and establishing a specific legal framework for PPPs. Additionally, they highlighted the need for training public officials and private partners in managing PPP projects.

Germany's assessment, conducted by BHH, emphasised the value of PPPs for fostering innovation, particularly through hands-on, collaborative learning environments. Despite well-organised funding, challenges persist in establishing diverse, sustainable networks and long-term projects. A proposed solution is to shift the mindset towards viewing collaboration as a foundation for innovation, rather than focusing solely on financial returns.

The European perspective, assessed by EURASHE and Hanse-Parlament, recognised PPPs' value in staff development, knowledge exchange, and bridging public-private divides. Challenges include finding suitable partners, intellectual property concerns, and administrative burdens. Key recommendations include creating supportive organisations like Katapult, implementing supportive regulations, and raising awareness of PPPs' value among stakeholders.

The intervention was structured as follows:

- A theoretical presentation using a role-model example: Challenges, best practices, and effective collaboration mechanisms were discussed based on the Dutch model. Following this, participants engaged in practical work, applying insights from the Dutch example to explore the potential for model implementation in their own context.
- A case-study presentation on model implementation: This session examined the barriers and constraints related to implementing the model, with a focus on how these factors vary across different national environments.

The main lessons learned for future applications of the collaborative PPP model, based on Dutch experience and assessments from other countries, highlight the following key components:

- Establish a clear and comprehensive purpose for creating your PPP. What is the motivation? What impact is intended?
- Increase awareness of the value and results of PPPs among all relevant stakeholders. Use this to build broad networks.
- Ensure that funding and legislation support the sustainability of long-term PPPs with diverse stakeholders.
- Have a dedicated support organisation in place within the local context.
- Provide training for VET centre staff on how to establish and manage PPPs effectively.

Additionally, during the PPP model implementation based on the Katapult experience, it is crucial to create a foundation for successful collaboration and mutual understanding:

- It is important to create awareness:
    - Public and Private Partners within the PPP establish their mutual interest: sometimes both might not be fully aware of *all possibilities when it comes to R&I activities*: show all possible types of research, research methods, and research outcomes.
    - Be aware that research can be done for various reasons (solve real life problem, improve educational programme, etc.) Include as many reasons as possible.
    - PPP partners need to be aware of the ecosystem they are part of.

- Time, money and personal investment are important
- An open mindset is incredibly important when doing R&I activities: also for PPP cooperation in general, but there are some specific needs when doing R&I:
  - Short term profits off the table.
  - Learning means: possibility to fail and learn.
- Dissemination is important for the impact on the region
- Enable peer-learning between PPPs as well

## 2.1. Timetable

**Agenda of May 28th**

| | |
|---|---|
| 13.30 | Opening by Barbara van Ginneken – Katapult |
| 13.35 | Presentation about the PPP-approach by Yorrick van Bree – Katapult |
| 14.15 | Presentation about PPP in practice by Heidi Kamerling - Yuverta |
| 15.00 | [Break] |
| 15.15 | Presentation about Financing a PPP by Martijn Pepers – Katapult |
| 16.00 | Announcement of the homework (incl. expected pitches on June 12th) by Dirk de Wit – ISSO |
| 16.15 | Closing of day 1 (Barbara van Ginneken - Katapult) |

**Agenda of June 12th**

| | |
|---|---|
| 13.30 | Welcome, programme of today - ISSO & Katapult |
| 13.45 | Pitches (15 min. each):<br>• Presentation of findings (Pitches) from each ecosystem, outside The Netherlands<br>• Basque Country, Germany, European perspective |
| 14.30 | Lessons learned: AIRinVET Dimensions for PPPs in the Netherlands Barbara van Ginneken (Katapult) |
| 14.45 | [Break] |
| 15.15 | Group discussion - ISSO & Katapult:<br>• How do we feel about the PPP approach when it comes to doing Research and Innovation activities?<br>• What did we learn?<br>• How could it be feasible?<br>• What about the funding? |
| 15.50 | Wrap up and suggestions for follow up - Katapult |

## 2.2. Speakers

**Barbara van Ginneken**, International Project Manager at Katapult (NL), holds a master's degree in psychology. She has worked on many projects in a wide variety of fields, mainly focussing on group processes, inclusion, diversity and sustainability. Barbara has been teaching at Radboud University (Nijmegen, NL) and is an experienced qualitative researcher. Currently, Barbara is involved in two EU projects: one concerning Applied Innovation and Research within Vocational Education and Training (AIRinVET) and one concerning recruitment for Green Vocational Education and Training (GREENVEU), as an international project manager for Katapult. In those projects she combines her passion for sustainability, education and research. To get in touch about this intervention, you can email her at: b.vanginneken@ptvt.nl

**Yorrick van Bree**, Project manager Public-Private Partnerships at Platform Talent voor Technologie (NL). He is an experienced Project Lead with a demonstrated history of working in the public policy industry. Skilled in Dutch, English, Teamwork and Politics. He is a strong programme and project management professional with a MSc focused on Chemistry from Leiden University.

**Heidi Kamerling**, Practor Green Liveable City (Urban Greening) / Applied Research within VET at Yuverta (NL). She holds a Master of Education in Learning and Innovating (UAS Wageningen).
States: "In fact, research-based learning is simply being curious about your environment."

The Green Liveable City professorship is one of the subject-specific green professorships. The green professorships are visible and findable, parties such as CIV Groen and Groenpact are working hard on this. As a result, vocational education really counts in the education column.
My subject-specific ambition is that everyone sees the urgency to green our living environment. The decline in biodiversity is a mega-acute problem. Finally, attention is being paid to this in the built environment, for example with nature-inclusive construction and nature-based solutions. And that is good, because we can only solve the biodiversity problem with physical greenery. Of course, there is also a relationship with climate adaptation and green-blue solutions.
Next to that I have a didactic ambition: within all green vocational education courses, there is room for **research-based learning in the curriculum**. I am convinced that students will benefit from an investigative attitude throughout their lives, with which they can acquire knowledge. To get there, we have to bring the student into that environment within education. I want to facilitate that shift in thinking. So get out of the classroom!

**Martijn Pepers**, Project Lead: Regional investment fund & NGF Public Private Partnership Scaling Up Plan at Katapult. He holds a Master's degree in Public Management (Utrecht University, the Netherlands). He has a strong passion for VET Education and the VET students.

**Dirk de Wit**, Project coordinator EU projects at Stichting ISSO (NL). Holds a M.Sc. Labour, Organisation and Management next to a B.Sc. Sociology (both Erasmus University Rotterdam) and a Bachelor's degree in General Operational Management (Hogeschool van Utrecht).
States: „Remember: innovation is the application of knowledge!"

He is an experienced researcher and advisor in innovation, knowledge, and organisation. With this knowledge, he works on fields that are in transition, both from the economy perspective (for example: innovation, knowledge, innovation ecosystems), and society perspective (for example: energy transition, learning for the future, social innovation). To get in touch about this intervention, you can email him at: d.dewit@isso.nl.

## 2.3. Summary

**Strengths**

Public-Private Partnerships (PPPs) have the potential to make applied innovation and research more accessible and achievable for VET centres. Implementing this intervention equips VET providers with a clear understanding of how PPPs can facilitate and enhance applied innovation and research within their organisations and regions. By engaging in applied research through PPPs, VET centres can improve the quality of their learning programs, better prepare students for employment, and address real-world challenges.

Additionally, this intervention highlights the broader role PPPs can play in regional development, demonstrating how shared innovations within a PPP framework can benefit the region as a whole. The real-life example presented by Heidi Kamerling illustrated the opportunities PPPs offer, such as enabling organisations to contribute to critical initiatives like the Green Transition.

The intervention not only outlined the advantages of PPPs but also provided practical insights into how they can be organised and funded. Discussions explored barriers and enablers, including organisational and regional strategies, funding mechanisms, and the importance of fostering an open mindset. Participants openly shared lessons learned, enriching the experience and offering practical value for all involved.

The two-session format proved particularly effective. The first workshop focused on theoretical principles, while the second session provided an opportunity for participants who completed preparatory work to explore how the PPP approach could be applied in their regional contexts.

Despite the varying regional contexts of VET centres, the PPP approach demonstrated its adaptability across diverse environments. This versatility is further supported by references to international Centres of Vocational Excellence (CoVEs).

**Weaknesses**

Because the regional contexts of VET centres differ, the form of the cooperation within PPPs might need to be adapted to the specific circumstances. Exploring how to do that best, is a more intensive process, that needs more time than this intervention could offer.
Nonetheless, the second session of the intervention enabled participants to identify and reflect on the elements most relevant to their unique contexts.

Strengthening government policies – at local, regional, and international levels – alongside VET institutional policies on collaboration within PPPs, could further enhance the effectiveness of these partnerships.

Fostering an open mindset that embraces continuous learning, including the ability to learn from mistakes, is crucial for sustained progress. Additionally, prioritising the professional development of instructors in applied research as a pedagogical approach would significantly support the effective implementation of R&I activities within VET centres.

**Opportunities**

The widespread shortages of skilled professionals across nearly all European regions underscore the urgent need for enhanced cooperation among VET institutions, SMEs, governments, and other stakeholders through Public-Private Partnerships (PPPs). Such collaboration enables VET centres to refine and modernise their learning curricula, ensures all partners have immediate access to the latest developments in their fields, and facilitates the alignment of diverse interests among stakeholders.

This PPP-based approach is particularly appealing to stakeholders from various European regions, as it offers a comprehensive and inclusive framework for addressing regional skills shortages. Moreover, the intervention can be adapted by individual VET institutions and tailored to meet the needs of their local and regional stakeholders.

Exploring the practices of Centres of Vocational Excellence (CoVEs) could further enhance international collaboration, creating synergies between VET institutions, SMEs, businesses, industries, governments, and other stakeholders. Facilitating knowledge exchange and cooperation among PPPs and CoVEs would provide significant opportunities for mutual learning and capacity-building, benefiting all parties involved.

**Threats**

The primary challenge identified by partners across various regions is securing sustainable funding for collaborations in the field of applied innovation and research within Public-Private Partnerships (PPPs).

In addition, successfully embedding R&I activities into organisational strategies requires strong advocacy efforts. This includes garnering support from institutional, regional, and national leaders to ensure these activities are prioritised and effectively integrated into long-term planning.

# 3. How to Prepare the Intervention

For the preparation of the intervention is given attention to three different perspectives, the organisational, educational and business perspective.

## 3.1. Organisational Perspective

To organise the intervention, the following key questions are helpful.

**When should you start preparing the intervention and with which activities?**

- **Defining Objectives - February 2024**
  - Review and analyse data from the interviews, case-studies and research on barriers, enablers and engagement activities, done in the foregoing stages of AIRinVET.
  - Gather, review, and analyse current literature to validate findings and address gaps.
  - Assess the feasibility of implementing the PPP model.
  - Discuss the concept, objectives, and intervention plan with AIRinVET partners.
  - Create the work plan and outline the core content assumptions for the intervention.
- **Recruitment of Participants and PPP Partners - Early March 2024**
  - Assess relevant stakeholders.
  - Prepare and send invitations.
  - Use communication channels to distribute information about the intervention.
- **Finalisation of Training Agenda - Early May 2024**
  - Identify relevant speakers for the intervention topics.
  - Set up the timeline and detailed intervention plan.
- **Preparation of Training Content and Homework - April & May 2024**
  - Assess components from Dutch practices that may be transferable.
  - Identify challenges, barriers, and best practices for PPPs.
- **Organisation of Practical Details - April & May 2024**
- **Conducting the Training - May 28th and June 11th, 2024**

**How many people should be involved in the preparation of the intervention?**

- One qualified facilitator with extended knowledge from the PPP Approach needs to be involved. Next to that it is important to invite an expert on (regional) PPP funding opportunities and an PPP participant who is willing to share his/her experiences in an interactive way.

**From which backgrounds should the people involved come?**

- The facilitator can have various backgrounds, as long as he/she has extended knowledge on the PPP approach.
- The person sharing best practices should have extended experience working on R&I activities within a PPP.
- The person sharing knowledge about funding opportunities for PPPs should preferably be an experienced fundraiser, but could also be a policy maker, or a stakeholder within a PPP with sufficient experience.

**What are the key resources you need to provide the workshop?**

- MS Teams (or other videoconferencing platform); PowerPoint; Poll Everywhere or other polling application.

**How should the "to-do" list look like before the workshop?**

- Set the Date and Venue
- Secure Speakers and Facilitators
- Confirm Technology Setup
- Create a Registration System
- Prepare Workshop Materials
- Develop a Promotion Strategy

- Schedule Breaks
- Finalise the Agenda
- Engage Stakeholders
- Plan for Feedback Collection
- Prepare for Q&A Sessions
- Confirm Follow-up Actions

### 3.2. Educational perspective

Selecting speakers with extensive expertise in collaboration on R&I activities within Public-Private Partnerships (PPPs) is crucial to the success of the workshop. Not only do they bring the required knowledge, but they are also able to answer any questions from the audience based on their own experience.

The real-life example(s) or best practice(s) presented should resonate with participants, clearly illustrating the benefits of PPP collaboration in applied R&I. It should also demonstrate the opportunities such collaborations create for VET centres, SMEs, and the broader region, emphasising how innovations can deliver value to all stakeholders, including society as a whole.

Conducting a pre-assessment of the participating VET institutions' contexts could further enhance the workshop's relevance. This would allow for better alignment of the content and ensure that examples provided are directly applicable to participants' specific circumstances.

Given that funding remains a significant barrier to collaboration, it is essential that this issue is addressed comprehensively during the workshop.

### 3.3. Business perspective

From a business standpoint, this intervention focuses on addressing the needs of local companies and communities. Businesses benefit from engaging VET students in solving their challenges through applied research and innovation activities. These efforts can support enterprises by contributing to areas such as product development, refinement, or diversification, enhancing services, optimising processes, advancing technologies, creating innovation systems, conducting feasibility studies, and more.
Business partners can represent any sector that aligns with the expertise and programmes offered by the VET institution. It is important to identify collaborators who are adaptable and not constrained by strict deadlines, as well as to set realistic expectations regarding the capabilities of students. Partnering with industries that have projects suited for longer-term exploration ensures a steady and manageable flow of opportunities. Selecting the right 'clients' is critical to fostering productive collaborations, delivering value to businesses, and providing meaningful learning experiences for students.

## 4. Curriculum for Intervention Workshop

### 4.1. Education Profile

No specific prior education is needed.

### 4.2. Target Group

- Leaders and managers of VET centres
- VET teachers with R&I experience/affinity
- Research administrators and managers
- Project officers
- Policy advisors
- Chambers of Commerce representatives
- Regional development agency representatives
- Other interested stakeholders

Note: based on the specific situation the target groups can differ and expanded with for example Higher Education institutes, bigger SMEs (or there representing bodies) etc.

## 4.3. Lecturer Profile

- The facilitator can have various backgrounds, as long as he/she has extended knowledge on the PPP approach.
- The person sharing best practices should have extended experience working on R&I activities within a PPP.
- The person sharing knowledge about funding opportunities for PPPs should preferably be an experienced fundraiser, but could also be a policy maker, or a stakeholder within a PPP with sufficient experience.

## 4.4. Intervention Objectives

- Acquiring knowledge of the ecosystem to assess the feasibility of using the PPP approach.
- Developing the ability to understand and apply concepts of the PPP approach.
- Gaining the ability to create customised curriculum solutions for the PPP approach.

## 4.5. Knowledge

- Understands the concept of a PPP.
- Knows what is required to establish and operate a PPP, including aspects of organisation, operation, and funding.
- Aware of the constraints and enablers within their own context to determine the feasibility of establishing and running a PPP.

## 4.6. Skills

- Applies the PPP model to different regions and ecosystems based on the approach presented in the workshop.
- Assesses their own context based on its characteristics and the possibilities of establishing and managing PPPs.
- Evaluates the potential applications of the PPP model.

## 4.7. Competences

- Possess a clear understanding of the potential for using the PPP approach within the ecosystem.
- Design and manage PPPs for innovative projects that support regional development.
- Ensure that applied research projects contribute to policy objectives, bridging the gap between educational practices and regional workforce needs.
- Communicate to the right persons and organisations which barriers and weakness should be solved to make PPP-projects possible in the own context.

## 4.8. Intervention Content

- Understanding the Katapult model for the PPP approach.
- Overview of the Dutch system and examples in the PPP field.
- Assessment of case studies from the Dutch ecosystem.
- Adapting and applying the Katapult model to other ecosystems.

## 4.9. Teaching Methods

- Power Point presentation – showing and explaining the PPP content.
- Examples and stories – illustrating how to do R&I activities within a PPP concerned with Urban Greening (Sharing a Best Practice).
- Q&A session – Participants were invited to ask questions to the presenter of the Best Practice (Heidi Kamerling).
- Homework – participants prepared a pitch about how the PPP approach could be applicable in their own region.
- Pitches: a speech or act that attempts to persuade someone do something (in this case: to do R&I activities within a PPP within each participant's own region).
- Online chat – encouraging participants to ask questions and share ideas.
- Group Discussions – sharing ideas, asking and answering questions and experiences in the group of participants (also: a collaborative conversation among a group of individuals who share a common interest or goal).

Links to definitions:

Presentation
https://en.wikipedia.org/wiki/Presentation#:~:text=A%20presentation%20conveys%20information%20from,present%20a%20new%20idea%2Fproduct

Example
https://dictionary.cambridge.org/dictionary/english/example

Q&A session
https://participedia.net/method/566

Homework:
https://en.wikipedia.org/wiki/Homework

Group Discussion
https://wikieducator.org/Group_Discussion

Online Chat
https://support.microsoft.com/en-us/office/chat-in-microsoft-teams-meetings-64e2cb91-8a11-4781-94ea-fbb23f2b922f#:~:text=Most%20Teams%20meetings%20include%20a,your%20IT%20admin%20for%20details.

Pitch
https://dictionary.cambridge.org/dictionary/english/pitch

## 4.10. Literature

Impact and added value (2023): https://wearekatapult.eu/files/downloads/Katapult%20Jaarverslag%202023%20EN.pdf

Various publications about Public Private Partnerships:
https://wearekatapult.eu/publications/

Building Blocks for Public Private Partnerships:
https://wearekatapult.eu/building-blocks/

Practoraat:
https://practoraten.nl/english/

For SMEs interested in PPPs:
https://wearekatapult.eu/connect-handbook-for-small-and-medium-sized-enterprises/

## 5. Key indicators

To assess the impact of the intervention, the following KPIs can be monitored.

**Organisational (Intervention):**

- Number of VET centres participating in the session.
- Number of companies participating in the session.

**Educational:**

- Percentage of research projects carried out in VET centres in your region compared to total projects in VET centres.
- Number of PPPs in your region.

**Business:**

- Percentage of training provided by VET centres to SMEs in your region.
- Percentage of services for SMEs developed by VET centres in your region.
- Number of patents developed between SMEs and VET centres.
- Number of grants related to the development of collaboration between VET centres and SMEs.
- Number of strategies related to the development of collaboration between VET centres and SMEs.
- Number of PPPs in your region.

# INTERVENTION: APPLIED RESEARCH IN VET IN THE BASQUE COUNTRY – EXTRAPOLATE TKGUNE

## 1. Introduction

The intervention topic is critical to the Basque Country's economic and educational development, particularly due to the region's positioning in the "highly innovative" category in the 2023 Regional Innovation Scoreboard. Despite this recognition, Basque innovative SMEs still underperform, highlighting a gap in the effective implementation of innovation within small and medium-sized enterprises. Recent reports and policy assessments underscore the need for strategies that enhance innovation management, knowledge transfer, and skill development to address this gap. This need makes the role of Tknika particularly timely and relevant. As a centre promoted by the Deputy Ministry of Vocational Education and Training within the Basque Government's Education Department, Tknika plays a pivotal role in strengthening the region's innovation ecosystem. Its mandate centres on advancing Basque Vocational Training through applied research, drawing on models from some of the most advanced vocational training centres globally. In the development of TKgune (an inhouse program of Tknika to foster innovation by VET for SMEs), Tknika has collaborated with policymakers, programme coordinators, companies, and vocational education and training (VET) centres, gathering both qualitative and quantitative data from various countries.

The primary goals of this intervention include:

- Gaining insights into the policy, corporate, and VET education ecosystem that supports applied research projects.
- Expanding the TKgune model by initiating an applied research programme that can be mobilised in other regional ecosystems.

The intended outcomes are to improve the alignment and coordination of policy, education, and industry in conducting applied research, ultimately strengthening the region's innovation capabilities and setting a standard for other ecosystems.

This intervention uniquely contributes to the Basque innovation ecosystem by enhancing knowledge sharing, promoting collaboration, and driving innovation across sectors. To identify development gaps for implementing the TKgune model in other partner regions, qualitative and quantitative indicators were used. Data was collected from stakeholders in the Netherlands, Germany, and Canada, offering insights into the feasibility of implementing the TKgune model in these areas. By identifying key drivers and opportunities for implementation, the intervention facilitates the spread of effective research-based strategies that can adapt to regional contexts and needs, fostering a more integrated and impactful innovation ecosystem across international borders.

## 2. Description of the Interventions

The intervention for fostering collaboration between vocational education and training (VET) centres and small and medium-sized enterprises (SMEs) in the Basque region was structured into five key thematic blocks. This approach provided participants with a comprehensive understanding of the regulatory framework, business landscape, and potential for adaptation of the Basque model in other regions. The intervention aimed to achieve five main objectives: understanding the policy frameworks that guide applied research, exploring the Basque business environment, showcasing the perspective of SMEs, highlighting the role of VET centres in applied research, and identifying gaps that could impact the implementation of this model in other contexts.

The first objective was to familiarise participants with the regulatory guidelines and policies that govern applied research projects. By delving into these frameworks, participants gained insights into compliance requirements and operational standards necessary for ensuring successful project execution.

The second objective was to provide a deep dive into the Basque business ecosystem. Through an exploration of the region's strengths, opportunities, and challenges, participants connected with stakeholders and industry leaders, creating a pathway for meaningful collaborations. This overview also highlighted how the Basque region's values and identity have shaped its business landscape, with a focus on innovation and sustainable practices.

The third component of the intervention focused on the perspective of SMEs, particularly their needs and the challenges they face in pursuing technological advancements. Participants examined real-world examples of how SMEs can benefit from partnerships with VET centres, which often provide the expertise and resources that SMEs may lack. The fourth objective highlighted the role of VET centres in the applied research process, demonstrating how these institutions conduct thorough needs assessments to align their research efforts with the specific demands of SMEs. Participants learned how VET centres work closely with SMEs to identify skill gaps and tailor training to support business growth.

Finally, the intervention encouraged participants to consider the feasibility of implementing the Basque model in their own regions. This fifth component was designed to help participants identify any gaps or barriers that might arise in adapting this collaborative framework elsewhere. Through this exploration, participants assessed factors that might influence the success of such a model in different socio-economic and regulatory contexts, drawing on insights from the AIRinVET project's interviews and research findings.

The intervention used a combined methodology of desk research and case study analysis:

1. Desk Research on Policy and Ecosystem Dynamics
   An initial presentation introduced participants to policy frameworks and the Basque ecosystem, covering key success factors and strategies. This provided a theoretical basis for understanding the factors that support effective applied research collaborations.
2. Case Study Analysis through Problem-Based Learning
   Through case studies of BRONYMEC S.A. and Don Bosco LHII, participants analysed real-world examples of SME and VET collaboration. This problem-based learning approach allowed them to explore practical challenges, solutions, and the management systems that support effective partnerships.

The intervention highlighted important lessons and practices from the Basque model that could be applied to other European regions, including:

- Building Collaboration: Encourage partnerships among VET centres across Europe to facilitate the exchange of best practices and research methodologies.
- Utilising Advanced Research Methods: Promote diverse research methodologies to enhance training quality and foster educational innovation.
- Increasing Funding and Support: Improve access to European and local funding sources to support VET centre initiatives.
- Standardising Processes: Develop a framework to standardise innovation and applied research practices within VET centres, ensuring consistency and high standards across projects.

This intervention offered a valuable framework for understanding the Basque model's strengths in VET-SME collaboration, presenting adaptable strategies that can be applied to improve socio-economic development in other regions. Additionally, quantitative and qualitative indicators were identified as integral components of the recommendations process.

## 2.2. Timetable

| Time | Content | Training provider |
|---|---|---|
| 10:00-10:15 | BLOCK 1<br>Existing education and industry policies for applied research projects. | BASQUE GOVERNMENT-Rikar Lamadrid |
| 10.15-10.50 | BLOCK 2<br>Description of the Basque ecosystem on applied research projects | TKNIKA - Pili Alonso |
| 10:50-11:30 | BLOCK 3<br>Example of the needs of an SME and its collaboration with a VET centre. | BRONYMEC – Amaia de Castro<br><br>IMH LHII - Oier Uriarte |
| 11:30-11:45 | BLOCK 4<br>Example of the management of an SME's needs by a VET centre. | DON BOSCO - Miren Canellada |
| 11:45-13:00 | Break | |
| 13:00-13:30 | BLOCK 5<br>Reflexion session | TKNIKA - Iñigo Mujika |

## 2.3. Speakers

**Iñigo Mujika**, he studied for a degree in Mechanical Engineering at the School of Engineering in Bilbao and then at the Polytechnic School of Donostia. As soon as he finished his degree, he started working at Elesa Transformadores as a mechanical designer and afterwards, he started working as a teacher and applied research project technician at the Oteitza Lizeo Politeknikoa, which carries out innovation projects for SMEs. For the last 3 years he has been working in Tknika as innovation driver between VET and companies. To get in touch about this intervention, you can email him at: mujika@tknika.eus.

**Miren Canellada**, she has a degree in chemistry, polymers specialization, from the University of the Basque Country (EHU-UPV, Donostia), and a PhD in polymers from the University of Pau et Pays de l'Adour (France). She is specialised in non-metallic new materials (plastics, elastomers, composites, biomaterials, nanomaterials...) and their industrial applications and manufacturing processes, design and eco-design, ...

Currently she is working in CIFP Don Bosco LHII TVET centre as Chemistry teacher and as TKgune programme coordinator, which objective is to develop applied innovation projects with companies to respond to the requirement to bring the teaching staff up to date in terms of science and technology, promoting innovation both in small and medium-sized companies and in vocational training centres. She is collaborating with Tknika in the area of applied innovation in strategic settings.

In Tknika, she has also been working in innovative technological projects since 2009, most of them related to composite materials (design, simulation, manufacturing, and validation of carbon fiber parts) in collaboration with companies and technological centres (Orona, Ikerlan, Luma Suite, ...).

**Oier Uriarte**, trained in the Machine Tool institute in Elgoibar, where he studied higher vocational training in assembly and maintenance of industrial equipment. He holds an engineering master´s degree CESI. His objectives are aimed at interacting with companies in the areas of people, training, services and technological projects.

He collaborated with Tknika (Applied Research Centre for Vocational Training in the Basque Country) in the TKgune Programme (Applied innovation projects for small and medium sized enterprises) as an external advisor.

**Amaia de Castro**, has over 13 years of experience in the polymer transformation industry, specialising in the machining and additive manufacturing of thermoplastic and composite materials. Since January 2021, they have been serving as the R&D Manager / Head of Additive Manufacturing at BRONYMEC, leading projects in material selection, design optimisation, and advanced manufacturing technologies. Their work focuses on replacing metal parts with plastic or composite solutions, achieving weight reduction, customised design, and functional optimisation.

With a strong academic background in engineering, including a specialisation in additive manufacturing (2019-2020) and a degree in Process and Product Innovation Engineering (2012-2016), complemented by a degree in Technical Industrial Engineering with a focus on Industrial Chemistry, this professional brings a robust combination of technical expertise and practical skills. They excel in adapting manufacturing solutions through cutting-edge technologies, with a focus on developing efficient and sustainable applications.

**Rikar Lamadrid** has been the "Director de Tecnología y Aprendizajes Avanzados (Basque Government, Education department, Vocational Education)" since 2017. It is the task of this Directorate to prepare the Professional Training of the Basque Country for the needs of this changing future. To educate and train the comprehensive people that Industry 4.0 and the society of the future need. This Directorate implements strategies to be able to carry out this challenge and drives the innovation for VET centres and the business fabric. Prior to this, he was director of the association of VET centres directors in Gipuzkoa, director of Aretxabaleta vocational centre, and a vocational education teacher. This background provides a wide knowledge of the VET education system in the Basque Country, and its innovation ecosystem in particular.

**Pili Alonso**, has a solid professional career linked to innovation, vocational training and engineering, with more than two decades of experience in strategic and technical roles. Since 2019, she has been Director of Applied Innovation in Strategic Environments at Tknika, the Basque Country's vocational training research centre, leading projects focused on green and digital transition and strengthening innovation in SMEs. Previously, she spent 13 years teaching in the Vocational Training network of the Basque Country, working in the automotive and mechanical manufacturing departments, where she combined her practical experience with teaching. Her career began in the industrial field, working at Mondragon Assembly for five years in project management and coordination, as well as working as a mechanical designer on automatic and manual assembly lines. At the same time, she has given training in CAD systems and programming, complementing her technical and teaching profile. Her experience is distinguished by a strategic vision and a practical approach to innovation and professional development in key sectors.

## 2.4. Summary

The intervention enables the mobilisation of applied research programmes, specifically expanding the TKgune model to other ecosystems. This can foster enhanced collaboration and mutual development between SMEs and VET centres, ultimately benefiting economic and educational outcomes.

**Strengths**

- **Benefits for the Local Ecosystem**: By integrating applied research into the VET framework, local businesses (especially SMEs) benefit from access to innovative technologies and research expertise. The intervention creates opportunities for workforce development tailored to regional needs, enhancing competitiveness.
- **Preparedness of Infrastructure and Academic Staff**: The Basque VET system's structure is already well-equipped, with established relationships between policy makers, companies, and educational institutions. This framework provides a robust platform for integrating applied research initiatives.

- **Existing VET Strategies**: The collaborative practices between VET centres and SMEs in the Basque Country are well-supported by existing policies, enhancing the ecosystem's capability for applied research and innovation.
- **Unique Knowledge and Resources**: The intervention benefits from insights drawn from established collaborations and applied research examples within the Basque Country. Such practical experiences offer valuable guidance for adaptation and implementation in new ecosystems.

**Weaknesses**

- **Barriers and Challenges**: The main challenges include the alignment of training programmes to meet the changing demands of the workforce and improving the engagement and collaboration between vocational centres and local industries.
- **Areas Needing Improvement**: Efforts are needed to create dedicated research and innovation hubs within VET centres, fostering a structured environment to carry out applied research.
- **Lacking Knowledge, Skills, and Competencies**: There is a need for continuous training and skill development among both educators and learners to address evolving industry needs effectively.
- **Missing VET Strategies**: Although there are collaborative practices, there is room to enhance policies supporting innovative engagement between SMEs and VET centres, such as integrating more advanced research methodologies.
- **Aspects to strengthen**: The engagement processes, updating curricula, and facilitating dual system/apprenticeship programmes can be improved to optimise the applied research ecosystem further.

**Opportunities**

- **Anticipated Policy or Strategy Changes**: Policy enhancements aimed at funding and supporting applied research initiatives, fostering international collaboration, and adopting innovative processes could bolster the intervention's success.
- **Supporting Trends**: The increasing focus on innovative, applied research methods in education and industry provides a favourable environment for integrating TKgune's approach in other regions.
- **Assets in Market and Stakeholder Expectations**: The intervention aligns well with the market's push for innovation and the need for industry-specific training, making it a valuable asset for SMEs and educational bodies.
- **Turning Strengths into Opportunities**: Building on existing strengths, such as established frameworks and policies, to expand partnerships and increase the scope of applied research across borders.
- **Turning Weaknesses into Opportunities**: Addressing knowledge and resource gaps can lead to establishing new centres of excellence and improving cross-sector collaboration, enhancing competitiveness and workforce capabilities.

**Threats**

- **Negative Trends Impacting Implementation**: Economic downturns or shifting political landscapes may impact funding and support for vocational training and applied research initiatives.
- **Unexpected Requirements**: VET centres might face challenges in adapting their facilities and training methodologies to meet the needs of emerging applied research projects.
- **Threats Related to Market and Stakeholder Expectations**: High expectations from SMEs and policy stakeholders might put pressure on VET centres to deliver cutting-edge innovation without adequate resources.
- **Obstacles to Success**: Barriers such as limited funding, resistance to change in traditional educational structures, and insufficient industry engagement could hinder the successful adoption and scaling of the intervention.

# 3. How to Prepare the Intervention

For the preparation of the intervention is given attention to three different perspectives, the organisational, educational and business perspective.

## 3.1. Organisational Perspective

To organise the intervention, the following key questions are helpful.

**When should you start preparing the intervention and with which activities?**

It is suggested to start preparing the intervention a month before the event date. It is important to clarify the aim of the intervention and after doing it, to detect the interesting people that are going to take part in the intervention. Then it needs to be coordinated, so a presential or online meeting is needed before the main day. Step-by-Step:

- **Needs Assessment (February-March 2024)**
  - Reviewing and analysing data on the Basque VET system's applied research processes.
  - Conducting consultations with SMEs, VET centres, and policymakers to identify transferable practices.
  - Gathering and analysing literature to identify gaps in applied research and innovation integration.
  - Sharing findings with project teams and validating the relevance of the Basque model in regional contexts.
  - Aligning findings with AIRinVET objectives and preparing recommendations for adaptation.
- **Design (March 2024)**
  - Defining high-level learning outcomes for the session.
  - Determining the training structure, methods, and approaches.
  - Drafting the content outline with emphasis on applied research scalability to diverse European contexts.
  - Consulting with stakeholders to refine the programme outline.
- **Development (March 2024)**
  - Creating session materials, including presentations, multimedia case studies, and reflective exercises.
  - Designing interactive activities to facilitate participant engagement.
  - Developing a post-session evaluation mechanism.
  - Preparing logistical plans and confirming participant recruitment.
- **Delivery (March 19, 2024)**
  - Finalising the session agenda and preparing participant materials (e.g., pre-readings).
  - Organising practical details (e.g., Teams link and session logistics).
  - Delivering a 2-hour online session covering key elements of the Basque VET system.
- **Evaluation (March-April 2024)**
  - Conducting post-session surveys to evaluate content, delivery, and participant outcomes.
  - Summarising evaluation findings and sharing results with project teams.
  - Following up with participants on optional assignments to assess knowledge application.

**How many people should be involved in the preparation of the intervention?**

- Between 4 and 6 people are needed.

**From which backgrounds should the people involved come?**

- Any teacher, trainer in VET interested in applied research.
- Any new or emerging applied researcher working in the VET system, regardless of academic or professional affiliation.
- Any company representative, and chambers of commerce, trade associations, development agencies.

**What are the key resources you need to provide the workshop?**

- People that are really involved in the topic of the workshop.
- Institutions that are needed.
- Expertise in the area of the audiovisual media.

**How should the "to-do" list look before the workshop?**

- Set the Date and Venue
- Establish a Planning Committee
- Secure Speakers and Facilitators
- Confirm Technology Setup
- Create a Registration System
- Prepare Workshop Materials
- Develop a Promotion Strategy
- Schedule Breaks
- Finalise the Agenda
- Conduct a Risk Assessment
- Engage Stakeholders
- Plan for Feedback Collection
- Prepare for Q&A Sessions
- Confirm Follow-up Actions

## 3.2. Educational perspective

Speakers should be selected from among stakeholders directly involved in applied research projects within the vocational education and training (VET) ecosystem, such as policymakers, industry representatives, and educators with hands-on experience. For example, the intervention highlighted speakers like Rikardo Lamadrid and Pili Alonso, who discussed policies and frameworks, and practitioners such as Amaia de Castro and Oier Uriarte, who shared case studies.

A structured questionnaire or reflective activity can be employed to identify gaps in applying the TKgune programme to other regions or countries. This was demonstrated in the reflection session, where participants identified challenges and opportunities for implementing the programme in their own context.

Potential participants can be found in SMEs already involved in innovation, local industry clusters, or those seeking expertise to address technological challenges. Tapping into networks like the AFM cluster for advanced manufacturing or similar organisations can help identify interested stakeholders.

## 3.3. Business perspective

Business representatives should be invited through existing networks and partnerships, such as chambers of commerce, trade associations, or regional business hubs. Highlighting the benefits of collaboration with VET centres and showcasing successful examples, as seen in the intervention, can be persuasive.

Potential participants can be found in SMEs already involved in innovation, local industry clusters, or those seeking expertise to address technological challenges. Tapping into networks like the AFM cluster for advanced manufacturing or similar organisations can help identify interested stakeholders.

To attract business representatives, it is essential to emphasise the opportunity to collaborate with VET centres, providing access to applied research and innovation resources such as technology hubs and advanced methodologies. Highlighting successful case studies, such as SME collaborations, and alignment with supportive business policies ensure a favourable environment for innovation. The initiative offers tangible benefits, including skill development, process improvement, access to high-level networks, and cost-effective solutions to enhance business competitiveness.

# 4. Curriculum for Intervention Workshop

## 4.1. Education Profile

No specific qualifications are required to participate.

## 4.2. Target Group

- Teachers and trainers
- Curriculum developers and instructional designers
- Academic leaders and managers
- Researchers
- Research administrators and managers
- Project officers
- Policy advisors
- Small and medium companies' representatives
- Chambers of Commerce representatives
- Regional development agency representatives

## 4.3. Lecturer Profile

The speaker must have actively participated in the TKgune programme, either in leadership, management, or technical roles. This implies having led or collaborated on applied innovation projects, understanding the working dynamics between Vocational Training centres and companies, and contributing to the scientific and technological updating of teaching staff as well as the promotion of innovation within SMEs.

## 4.4. Intervention Objectives

- Developing an understanding of the TKgune model and its mechanisms for supporting applied research in VET.
- Gaining the ability to apply the TKgune model to different ecosystems, adapting it to local contexts to enhance regional innovation and collaboration.
- Acquiring skills in collaborative research with SMEs to foster innovation and practical problem-solving within VET centres.

## 4.5. Knowledge

- Understands the significance of applied research in fostering innovation within VET centres.
- Explains the role of applied research in bridging education and industry needs, particularly for SMEs ecosystem in the region.
- Identifies core components and stages of the applied research process in VET, focusing on its implementation within institutional ecosystems.
- Outlines how policy and institutional support enhance the effectiveness of applied research, including mechanisms that foster knowledge transfer and research-driven skill development.

## 4.6. Skills

- Ability to evaluate applied research examples, analysing methodologies, and interpreting research findings relevant to the collaborative ecosystem between VET centres and SMEs.
- Ability to collaborate with researchers, policymakers, and SMEs to facilitate the integration and development of applied research.
- Reflects critically on the role of policy and organisational support in applied research, identifying improvements to support research initiatives within the VET ecosystem.

### 4.7. Competences

- Designs and manages applied research initiatives within VET centres in collaboration with industry partners, ensuring alignment with educational and industry goals.
- Integrates applied research projects into VET curricula to create seamless learning experiences that connect theoretical knowledge with practical applications.
- Leads collaborative applied research projects with SMEs, focusing on innovative solutions that address industry challenges and enhance student employability.
- Ensures that applied research projects contribute to policy objectives, bridging the gap between educational practices and workforce needs in the region.

### 4.8. Intervention Content

- Understanding regulatory frameworks for applied research and SME collaboration.
- Overview of the business ecosystem and innovation landscape.
- SME perspective on technological advancement and collaboration needs.
- VET centre's role in addressing SME needs through applied research.
- Extrapolating the TKgune model to other ecosystems.

### 4.9. Teaching Methods

- Problem-based learning
  - This model is reflected in the assessment of SMEs' needs to identify specific gaps and propose innovative solutions in collaboration with vocational education and training (VET) centres. Participants developed practical skills by addressing real problems in their regions.
- Case studies
  - Case studies, such as the collaborations between the company Bronymec and VET centres, were used to demonstrate how specific business needs can be addressed through applied research projects. These cases highlighted real-life examples of success and challenges in the process.
- Presentations
  - Presentations provided a structured framework for experts to share policies, experiences, and methodologies in applied research. These sessions were complemented with multimedia resources and reflective discussions.

### 4.10. Literature.

- TKGUNE https://tkgune.eus/
- TKNIKA https://tknika.eus/eu/
- IMH Campus https://www.imh.eus/eu
- DON BOSCO https://www.donbosco.eus/es/
- BRONYMEC https://tkgune.eus/en/project/molde-baten-diseinua-eta-fabrikazioa-fabrikazio-aditibo-bidez-pieza-funtzionalak-fabrikatzeko-erretxinen-infusio-bidez/
- ZUBACOR https://www.youtube.com/watch?v=ZiksZDcqiCo
- PowerPoint presentations

## 5. Key indicators

To assess the impact of the intervention, the following KPIs can be monitored.

**Organisational (Intervention):**

- Number of countries participating in the session.
- Number of companies participating in the session.
- Number of VET centres participating in the session.
- Number of surveys completed after the intervention.

**Educational:**

- Percentage of Continuous Training that takes place in VET centres in your region per person employed in VET centres.
- Percentage of Final Degree Projects developed in VET centres in your region compared to total projects in VET centres.
- Percentage of research projects carried out in VET centres in your region compared to total projects in VET centres.
- Number of courses related to the topic of the intervention introduced by VET centres.

**Business:**

- Percentage of training provided by VET centres to SMEs in your region compared to the total number of SMEs.
- Percentage of services for SMEs developed by VET centres in your region compared to the total services used by SMEs.
- Number of patents developed between SMEs and VET centres.
- Number of grants related to the development of collaboration between VET centres and SMEs.
- Number of strategies related to the development of collaboration between VET centres and SMEs.

## 6. Annexes

Block 3: Bronymec S.A example: SME Needs and Collaboration with a VET centre.

Block 1,2,4: Video recorded of the session https://www.youtube.com/watch?v=MtosLIyfX9s

# INTERVENTION: EXTRAPOLATION OF THE FRAMEWORK FOR EXPERIENTIAL LEARNING AND RENEWED CORE EMPLOYABILITY COMPETENCIES – NEW BRUNSWICK COMMUNITY COLLEGE (NBCC)' EXPERIENCE (CANADA)

## 1. Introduction

Applied Research focuses on finding practical solutions to real-world problems by creating or improving processes, products, or services. In most Canadian colleges, applied research is driven by partnerships with industry or community organisations that bring specific challenges in need of solutions. Applied research projects consist of four key components, beginning with the partner's practical problem based on specific needs and parameters.

Applied Innovation and Research (AIR) not only benefits industry and community partners but also has positive impacts on social and economic development. For VET institutions, however, the primary motivation for engaging in applied research is to enrich students' learning experiences. Through AIR, students have opportunities to engage directly with real-world challenges, which can boost their interest and motivation far more effectively than textbook cases. By working on applied research projects, students develop essential technical and professional skills, preparing them well for both the workforce and further education. These skills, including communication, collaboration, adaptability, and problem-solving, align with employer needs.

Experiential learning is a highly effective pedagogy that deepens and enriches students' understanding. Applied research, as a form of experiential learning, involves industry or community collaboration and is often considered work-integrated learning or career-readiness training. Also known as problem-based, project-based, challenge-based, or inquiry-based learning, applied research projects can lead to new or improved processes, products, or services. In this way, VET institutions not only enhance student learning but also support the socio-economic needs of local and regional communities.

The intervention provided by New Brunswick Community College consisted of two workshops that aimed to guide stakeholders on enhancing students' learning experiences while contributing to the socio-economic growth of their regions. This was achieved through a framework that integrates experiential learning and core employability competencies directly into the programme curriculum.

A key insight from the intervention highlighted the importance of enhancing, establishing, and strengthening the applied research ecosystem within vocational training. To successfully embed applied research into the vocational education environment and culture, Canadian colleges have identified four essential success factors: (1) institutional commitment and leadership; (2) instructor development and support; (3) curriculum and competency development; and (4) collaboration. The intervention featured a presentation on Canadian good practices in applied research and innovation, followed by an interactive exploration and discussion on how these practices could be adapted for the European ecosystem.

## 2. Description of the workshop

The intervention involved the facilitation of two online workshops: Workshop 1: Applied Research and Experiential Learning and Workshop 2: Integrating Applied Research in Programme Curriculum. The workshop facilitator demonstrated to partners and others how to enhance the learning experience for students while also contributing to the socio-economic growth of their regions through frameworks for experiential learning and core employability competencies integrated into programme curriculum. The workshops explored how core employability competencies and experiential learning can prepare learners for the future of work and how VET institutions can ensure effective integration of applied research in their educational programmes.

**Workshop 1: Applied Research and Experiential Learning** began with an overview of how one Canadian college successfully integrated applied research as a form of experiential learning in programme curriculum, while also drawing from the experiences of other Canadian colleges. It highlighted how student engagement in applied research develops professional, employability skills while also providing opportunities to practice technical skills. The frameworks were explained, with a focus on teaching and

learning implications. Success factors for implementation were also discussed. The session was delivered through MS Teams and engaged participants using the polls and chat tools as well as discussion questions. This workshop was intended for VET leaders, project partners and others who were interested in enhancing the learning experiences for students while also serving the socio-economic needs of local companies and communities.

**Workshop 2: Integrating Applied Research in Programme Curriculum** was an interactive online session facilitated through MS Teams. It was intended for VET instructors and curriculum developers. In this session, specific examples and tactics were shared on how to improve teaching practices and enhance student learning through the integration of applied research and programme curriculum. The purpose of the second session was to equip participants with ideas and actions that could be implemented in their VET programmes. In break-out groups, participants connected applied research projects with programme learning outcomes.

The workshop was structured around an applied research methodology that begins with **Problem Identification**, involving the selection of a relevant problem that aligns with the course learning outcomes. This could be initiated by the partner, instructor, and or applied research staff. This is followed by **Partner Needs & Parameters**, where the partner is engaged to understand their needs, priorities, and constraints, and to define clear project objectives. Next, **Programme or Course Learning Competencies** are reviewed by the instructor to identify relevant competencies within the curriculum, ensuring that the project objectives align with learning outcomes. Once the scope and details of the project are confirmed, **Solution Development** is facilitated by the student through collaborative discussions with the client on potential solutions, encouraging innovation and considering feasibility and sustainability. Finally, the student's work is assessed based on the relevant learning outcomes.

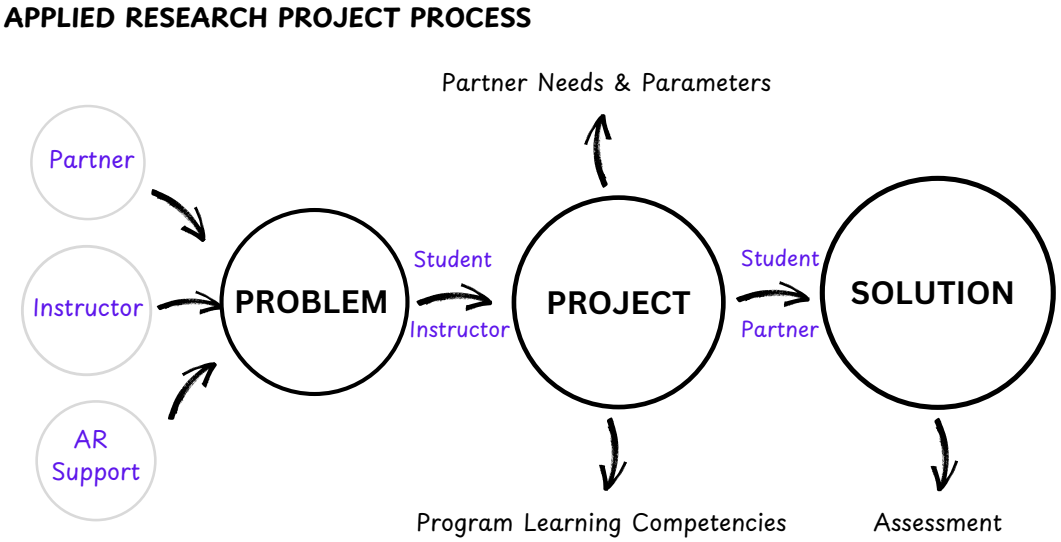


Fig. 2- Applied Research Process

From a strategic perspective, Canadian colleges that have successfully integrated applied research and innovation demonstrate a strong organisational commitment to these goals. Operational leadership is also critical; successful institutions dedicate resources to both the implementation and sustainability of applied research activities.
Instructor development is a foundational element, with proven practices focusing on faculty orientation, ongoing professional development, and effective recruitment and hiring.

A focus on student learning is essential for successfully embedding applied research in vocational education and training. Integrating applied research into student learning must align with the curriculum, learning competencies, and core employability skills. The experiential learning framework shared in the intervention provides valuable guidance for achieving this integration.

Finally, collaboration with industry and community partners is crucial to college-led applied research and innovation. Internal collaboration with institutional departments is also important, yet applied research must be driven by the needs of external business and community partners to ensure relevance and impact.

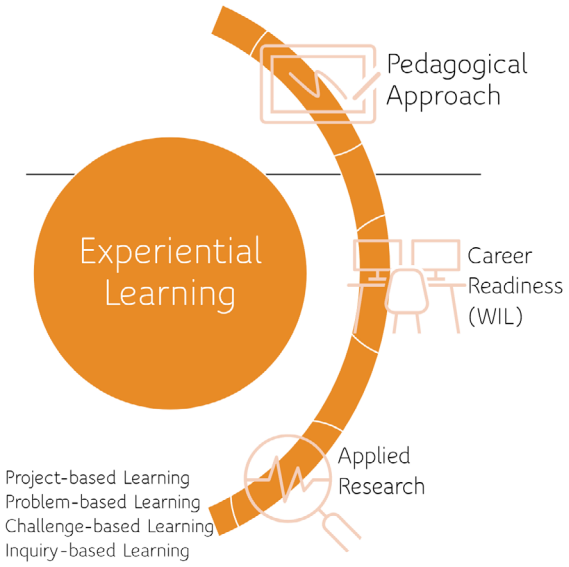


Fig. 3 - Experiential Learning Framework

## 2.1. Timetable

**Session 1: Applied Research as a Form of Experiential Learning**
**2:00-4:30 pm Central European Time, June 25, 2024**

| Time and duration | Learning objectives | Content |
|---|---|---|
| 2:00-2:30 (30 min) | Discuss the benefits of experiential learning and employability competencies for TVET students | Welcome & Introduction (10 min)<br>What is Experiential Learning (10 min)<br>Technical & Professional Skills<br>-Skills for Success (10 min) |
| 2:30-2:50 (20 min) | Explain how applied research is a form of experiential learning/work-integrated learning | Applied Research – _Inquiry-based Learning, PBL, etc.<br>Framework for ARI |
| 2:50-3:10 (20 min) | Recognise how engaging in applied research develops employability competencies and professional skills | Roles, Responsibilities and Process<br>Examples - video |
| 3:10-3:30 (20 min) | Describe the key components for successful integration of applied research in programme curriculum | Success Factors – _Study of 10 Canadian Colleges |

**Session 2: Integrating Applied Research in Programme Curriculum**
**2:00-4:30 pm Central European Time, June 27, 2024**

| Time and duration | Learning objectives | Content |
|---|---|---|
| 2:00-2:20 (20 min) | Translate the framework and components to their institutional contexts | Welcome & Introduction (10 min)<br>Review of Framework/Process (10 min) |
| 2:20-2:45 (25 min) | Identify a potential applied research project that would meet expected course outcomes | Case Study (15 min)<br>Other Examples (10 min) |
| 2:45-4:00 (75 min) | Demonstrate how applied research as a form of experiential learning can be integrated in a course or programme | Break-out Work Groups (45 min)<br>Report Back (30 min) |
| 4:00-4:30 | Design an applied research project with an industry or community partner that is aligned with course content and meets course outcome(s) | Optional post programme assignment<br>Wrap Up |

## 2.2. Speakers

**Dr. Diane Burt** is an experienced educator and educational leader. She has been involved in teaching and training in the non-profit, for-profit, and public sectors, but spent most of her career in higher education leadership roles, including Principal, Director, and Associate Vice President. She won awards for her work as the Director of Applied Research and Innovation at the New Brunswick Community College, where she established and successfully grew the College's Office of Applied Research. Currently, she consults and facilitates courses and workshops in the areas of adult and vocational education, applied research, leadership and change. Diane holds a BA in English, BEd in Secondary Education, MEd in Adult Education, and EdD in Educational Leadership. To get in touch about this intervention, you can email her at: diburt@outlook.com.

## 2.3. Summary

**Strengths**

Implementing this intervention helps VET providers understand how engaging students in applied research can improve the quality of learning and better prepare students for employment and real-world applications. Experiential education through collaboration with employers is a proven method of enhancing student engagement and understanding. Offering the intervention in two separate workshops was an advantage as the first session focused on the broader overview and appealed to a wider range of participants, including VET leaders and research administrators. The second session was more interactive and was tailored to VET instructors and curriculum development specialists.

**Weaknesses**

The VET contexts differ widely across countries and regions, so it is difficult to identify which elements of the intervention may apply to various VET institutions; however, the break-out discussions in the second workshop allowed participants to identify and explore the elements that were relevant to them. Government and VET institution policies on industrial-educational collaboration could be strengthened. Also, professional development for instructors on applied research as a pedagogical approach would assist with effective implementation.

**Opportunities**

A growing interest in integrating applied research into education programmes presents a timely opportunity for this workshop. Also, increasing demand for experiential learning opportunities in vocational education can attract more participants to the workshop. The workshop could be expanded to offer ongoing support and resources for participants interested in further developing applied research programmes. A detailed follow-up survey and subsequent feedback from participants might allow the framework to be better adapted to different contexts. Then the workshops could be adapted by individual VET institutions and be delivered to relevant internal staff and instructors. There is potential to partner with vocational education institutions to offer the workshop as part of their professional development programmes.

**Threats**

Resistance from some educators or institutions to adopt new approaches to teaching and learning is a threat. The biggest obstacle, however, is a lack of governmental and institutional awareness. In several countries, the level of readiness for a change of this magnitude was identified as low. The key to transferring the framework to the European contexts is changing the education sector culture. This can start with a vision for the change and will require governments and VET institutions to work together.

## 3. How to Prepare the Intervention

For the preparation of the intervention is given attention to three different perspectives, the organisational, educational and business perspective.

### 3.1. Organisational Perspective

To organise the intervention, the following key questions are helpful.

**When should you start preparing the intervention and with which activities?**

- **Needs Assessment (February-March 2024)**
  - Reviewing and analysing data from the AIRinVET project reports (Outcomes section)
  - Gathering, reviewing and analysing current and relevant literature to validate and address gaps
  - Documenting findings and sharing with project team
  - Comparing analysis of European contexts with NBCC's frameworks, approaches and processes
  - Consulting with partner VET institutions in Spain, the Netherlands and Germany on their current applied research and experiential learning approaches and processes and the potential scalability of the NBCC framework to their contexts
  - Redesigning the model or models for the European VET institutions and validating if required
- **Design (March 2024)**
  - Determining the high-level training outcomes
  - Determining the structure, approach, methods and timing for the training
  - Defining the learning objectives and target audience for the training
  - Drafting and sharing high-level programme outline with project team
- **Development (April-May 2024)**
  - Building programme content
  - Creating teaching materials and visuals
  - Developing learning activities
  - Developing programme evaluation
  - Recruiting participants
- **Delivery (June 2024)**
  - Finalising training agenda
  - Organising practical details
  - Contacting participants - send pre-readings and Teams link
  - Delivering two online sessions
  - AIRinVET Curriculum Template
- **Evaluation (June-July 2024)**
  - Conducting evaluation of programme content, delivery and outcomes
  - Summarising and sharing results with project team
  - Following up with participants on optional assignment as applicable

**How many people should be involved in the preparation of the intervention?**

- One qualified facilitator is required for the preparation and delivery of the workshops; two co-facilitators with complementary skills and expertise would be beneficial.

**From which backgrounds should the people involved come?**

- Adult educator with expertise in experiential learning and applied research.

**What are the key resources you need to provide the workshop?**

- MS Teams (or other videoconferencing platform); PowerPoint; Poll Everywhere (polling application).

**How should the "to-do" list look like before the workshop?**

- Set the Date and Venue
- Establish a Planning Committee
- Secure Speakers and Facilitators
- Draft Workshop Plan, Title and Description
- Confirm Technology Setup
- Create a Registration System
- Prepare Workshop Materials
- Develop a Promotion Strategy
- Finalise the Agenda
- Schedule Breaks
- Conduct a Risk Assessment
- Engage Stakeholders
- Plan for Feedback Collection
- Prepare for Q&A Sessions
- Confirm Follow-up Actions
- Deliver Workshops
- Conduct Evaluation

### 3.2. Educational Perspective

It is important to find a speaker with educational qualifications, such as a master's degree in education, and experience in experiential learning and applied research. In Canada, most colleges employ people with this expertise in their applied research and/or teaching and learning centres. A pre-assessment of the contexts of the participating VET institutions is useful in order to better align the workshop content and provide relevant examples. The main educational value is focused on enhancing the learning experiences for students. Applied research instils a mindset of inquiry and continuous learning. Engaging in research projects develops students' core employability and professional skills and prepares them for the workplace.

### 3.3. Business Perspective

From a business perspective, the intervention is about serving the socio-economic needs of local companies and communities. The value for businesses is having VET students address their challenges through applied research and innovation. Applied research and innovation can help companies with new product development, product improvement or diversification, service improvements, innovative processes, technology development, innovation systems, feasibility testing, and more. Business representatives can come from any sector that aligns with the VET institution's programmes. Find partners who are flexible and for whom timing is not critical and be realistic about student capabilities. Seek industry clients who have projects that are not 'pressing' to ensure a steady stream of projects. Client selection is important to ensure effective and meaningful partner engagement and value to students.

## 4. Curriculum for Intervention Workshop

### 4.1. Education Profile

This train-the-trainer programme will be of interest to TVET institutions that want to enrich students' learning experiences and better prepare them for the workforce while contributing to the applied research needs of industry and community organisations.

## 4.2. Target Group

- Teachers and trainers
- Curriculum developers and instructional designers
- Academic leaders and managers
- Researchers
- Research administrators and managers
- Project officers
- Policy advisors

## 4.3. Speaker Profile

The speaker or facilitator of the workshops should be a qualified adult educator with expertise in experiential learning and applied research.

## 4.4. Intervention Objectives

- Promote student engagement in experiential learning by fostering a supportive and inclusive college culture.
- Strengthen teaching practices to drive measurable improvements in student learning outcomes.
- Adapt and apply the Canadian college experiential learning framework to relevant scenarios within the EU context.

## 4.5. Knowledge

- Knows the benefits of experiential learning and how it fosters employability competencies in TVET students.
- Describes how applied research is a form of experiential learning and work-integrated learning.
- Identifies the role of applied research in enhancing employability skills and professional competencies.
- Outlines the essential elements for successfully integrating applied research into programme curricula.

## 4.6. Skills

- Adapts the concepts of experiential learning and applied research to fit specific institutional and programme requirements.
- Evaluates potential applied research projects that align with intervention outcomes.
- Illustrates practical ways to embed applied research projects into intervention designs, ensuring they enhance student engagement and employability skills.

## 4.7. Competences

- Designs and coordinates applied research projects in collaboration with industry or community partners that align with the content of the intervention.
- Ensures that research projects meet both academic goals and real-world employability competencies.
- Leads the integration of these projects within the course or programme, ensuring seamless collaboration between educational and industry/community partners.

## 4.8. Intervention Content:

- Overview of how the college successfully integrated applied research into the programme curriculum as a form of experiential learning.
- Overview of the framework outlining the implications for teaching and learning.
- Case study assessment of improved teaching practices and enhanced student learning through the integration of applied research in the programme curriculum.

## 4.9. Teaching Methods:

The workshops utilised the following methods:

- PowerPoint presentation – showing and explaining the workshop content
- Examples and stories – illustrating how to use applied research in the classroom
- Online polls and word clouds –interactively engaging the participants in the sessions
- Online chat –encouraging participants to ask questions and share ideas
- Break-out discussions –sharing ideas and experiences and applying the learning in small groups

Definition Links:

- Presentation
- Example
- Online Poll
- Breakout Discussion
- Online Chat

## 4.10. Literature

**Books, publications, reference materials**

- Duraisingh, L. & Sachdeva, A. (2021). Inquiry-driven innovation. Jossey-Bass.

**Articles, research papers, conference papers**

- Mann, S. & Nelson, R. (2020). Experiential learning and the new foundation of the vocational education sector. ITP Research Symposium. https://www.researchgate.net/publication/351973116_Experiential_learning_as_the_new_foundation_of_the_vocational_education_sector

**Case studies and institutional models (e.g. examples of interventions or programs already in place)**

- NBCC Experiential Learning Framework

**Multimedia (e.g. videos, interactive tools)**

- CiCan Applied Research. https://www.collegesinstitutes.ca/what-we-do/our-priorities/boosting-innovation/
- NBCC Applied Research and Innovation: Value Added Food Product Development [YouTube Video]. https://www.youtube.com/watch?v=Wtkb4Ye8qCk
- PowerPoint presentations

**Training materials (handouts, templates, posters)**

- Sample course outline

# 5. Key Indicators

To assess the impact of the intervention, the following KPIs can be monitored.

**Organisational (Intervention)**

- Number of countries participating in the session.
- Number of VET centres participating in the session.

**Educational**

- Number of faculty professional development opportunities in VET centres related to applied research.
- Percentage of VET students engaged in applied research compared to total number of students in VET centres.
- Number of courses that incorporate applied research in VET centres.

**Business**

- Percentage of SMEs in your region partnering with VET centres on applied research.
- Number of strategies related to the development of collaboration between VET centres and SMEs.

# 6. Annexes

- D.Burt, Applied Research & Experiential Learning, Intervention 5: Applied research as a form of experiential learning in VET program curricula
- D.Burt, Integrating Applied Research in Program Curriculum, Intervention 5: Applied research as a form of experiential learning in VET program curricula
- List of recommendations

# INTERVENTION: ENHANCE LEARNERS' CURRICULUM – APPLICATION OF WORK PROCESS ANALYSIS (WPA) FOR SME'S IN HOUSE TRAININGS

## 1. Introduction

Effective mechanisms for engaging VET stakeholders are critical to fostering innovation and driving the practical application of Vocational Education and Training (VET) research. This intervention focuses on equipping stakeholders with the tools and methodologies needed to implement innovative solutions in their daily work, bridging the gap between scientific research and workplace practice.

This intervention introduces a comprehensive tool to redesign learning units based on the latest VET scientific research, providing a structured approach to enhancing vocational education. It equips participants with essential skills in applied research methods for collaborative projects with SMEs, enabling them to design industry-aligned curricula. By mastering tools like work process analysis and competence profile matrices, participants can create targeted training solutions that align with local, regional, and national workforce needs.

The intervention specifically aims to enhance the quality of existing further training measures for VET stakeholders through train-the-trainer programmes centred on work process-oriented training. This approach involves reorganising existing course concepts to ensure the seamless transfer of innovative scientific learning content into practical applications within the workplace. Participants will develop a deeper understanding of work processes, spheres of action, competence profiles, and the holistic structure of German vocational training.

In addition, participants will gain practical insights into applied and innovation research methods used in collaborative projects with SMEs. They will learn to create customised solutions using research instruments such as work process analysis tools and competence profile matrices to improve learners' curricula effectively.

By fostering collaboration and strengthening SME involvement in workforce development, this intervention contributes to a more adaptable, skilled, and innovative vocational education system. Ultimately, the initiative promotes sustainable knowledge transfer, ensuring that vocational education remains relevant and responsive to the evolving demands of modern industries.

## 2. Description of the Interventions

In the first step, a German overview of applied research conducted by the VET Centre was presented. This included a framework for creating the work process and defining the professional, methodological, and social competencies needed for effective vocational education and training. The overview also outlined the main project stages of the work process—acceptance, planning, implementation, and completion—within the scope of these competencies. Following this, a practical example of a work process was presented, focusing on the carpenter profile.

In the next phase, participants received a practical task to complete, structured around the work process and addressing the following questions:

1. Provide a brief description of your main field of (business) activity.
2. Describe the specific activities you perform and are responsible for.
3. What is the final outcome of your work process? Or: What is the last step you take to complete the process?
4. What is the next step for your product or activity? Who depends on the results of your work?
5. Describe any preliminary work you rely on from other individuals or departments.
6. Provide a detailed description of the activities you perform in each phase of the work process. What tasks are involved in each phase?
7. What resources, tools, records, or documentation do you need at each phase of the work process?
8. Are there any customer inquiries? If so, how do these inquiries affect your work process?

9. Which legal regulations must you comply with? Which regulations are relevant to each phase? (e.g., standards, contracts, workplace safety)
10. Do you need to establish any operational agreements? At which phase are these agreements necessary? (e.g., further use of the product, internal charges, organisational relevance)
11. How many people from your department are involved in the work process you described?
12. Is there a need for additional training or qualifications? What further training would be beneficial for your department?

The second session began with a recap and presentation of participants' findings, followed by an expert-led workshop on validating and refining the curriculum using applied research tools. Participants were provided with a handbook and implementation guidelines, equipping them with practical resources to apply these principles in their own VET programmes.

The intervention was structured as follows:

- **Theoretical Presentation**: An overview of applied research methods within collaborative projects involving SMEs, developed by BHH and successfully implemented for over 20 years.
- **Case Study**: An exploration of how the methodology for collaborative applied research can be adapted and implemented in various regions and countries

The added value of the session was that participants gained a step-by-step understanding of implementing and addressing the needs of SMEs in creating learning and technical solutions and gain professional competence. They also learned how these solutions can be transferred to local, regional, and national ecosystems.

**The intervention is split in three main phases:**

1. In the first phase the course participants become acquainted with the concept of the working process-orientation and the Work Process Matrix as a tool for analysis and description of working processes. Every participant carries out an independent working process analysis in their specific sector.
2. In the second phase the course participants evaluate the results of the working process analysis. This includes a reflection about the handling of the tool. In addition, they become acquainted with the next tool, the Profile of Competencies. Every participant works self-dependently on the Profile of Competencies. The results of the working process analysis are written out in full. Furthermore, they define the technical, methodological and social aims needed for the execution of the working process.
3. In the third phase the course participants evaluate the results of the description of the competencies and become acquainted with the Planning Instrument for Training Modules. Subsequently the participants design a course for a group they are currently teaching. (In case a course participant is not teaching an own group a real teaching situation shall be organised.) The course participants carry out their planned new module, evaluate it and document the whole process. There is no determination for the duration of this phase.

The structuring elements of the course are the three tools outlined below:

- Work Process Matrix
- Profile of Competencies
- Planning Instrument for Training Modules

**Work Process Matrix**

The construct "Work Process" acts as an analytic category to the development and analysis of professions. Working processes are typical for each profession and represent sub zones of the company's business process. They are linked to tasks and work orders respectively.

A working process takes on concrete working results, methods, tools and organisational forms of professional work with their individual, operational and social references and requirements. The subjects are concrete products or services. A working process represents a complete operational cycle including planning, implementation, control and evaluation.
The outlined elements of a working process can be merged to the so-called "Work Process Matrix" see figure 1. In the matrix the social, operational and costumer-oriented requirements, the tools and supplies for work and the methods as well as each step of action are broken down for each step of the working process – the order acceptance, the order planning, the order processing and the order completion.

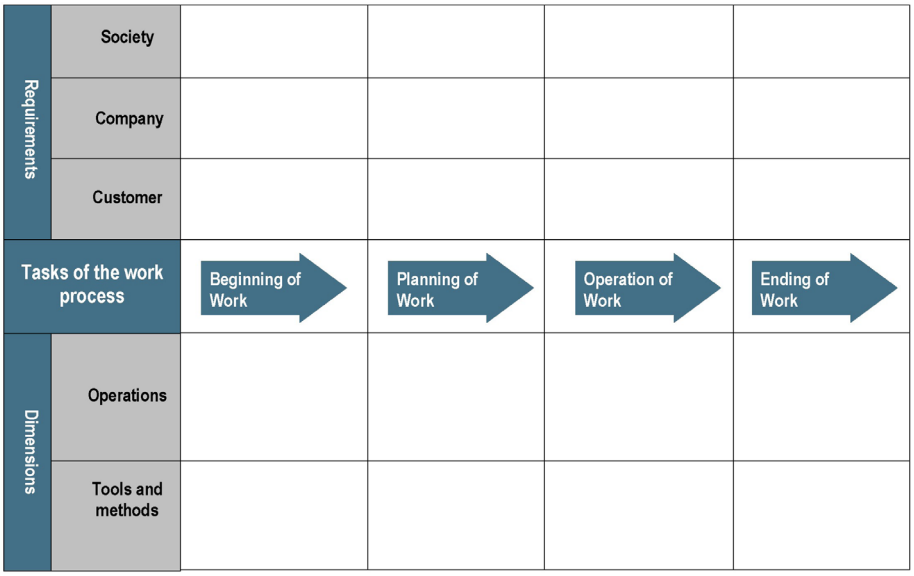


Figure 4 - Work Process Matrix

## Profile of Competencies

Certainly, the identifying working processes are always specific and depend on personal, business-oriented, regional, product-oriented and operational characteristics. That means that working processes provide a basis for applied and innovative learning units but cannot be used for structuring a curriculum or defining the aims of trainings. Therefore, the intermediate stage of the Profile of Competencies is established. It contains a generalising summary of the working process as well as a statement of the basic skills, ordered by professional competence, methodological competence and social competence.

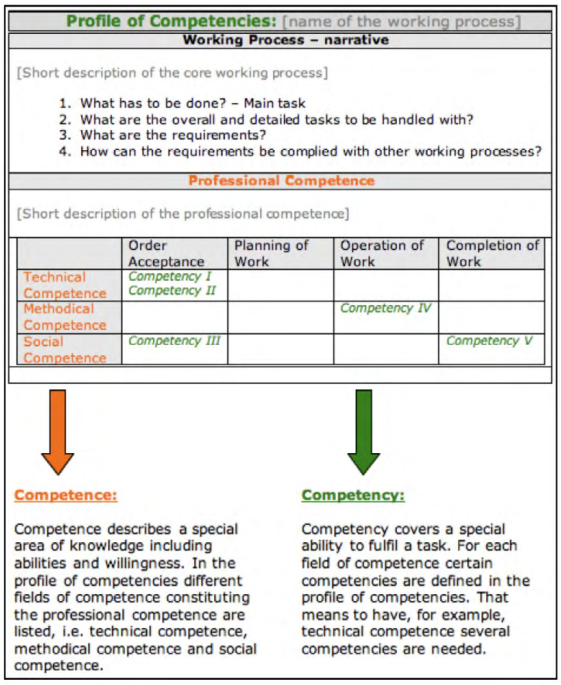


Figure 5 - Competency Profile - The use of competence and competency

### Planning instrument for Applied and Innovative learning units

Applied and Innovative learning units stand for a didactic concept tending to a working- and working process-oriented vocational education. This concept integrates process- and task-oriented learning in terms of project work. Learning occurs by working on situations and problems of the professional reality. Thus, the coherence between vocational education and professional environment is pointed out. The potential for education and qualification of the professional reality is used for vocational training.

Generally, the Applied and Innovative learning units go through the phases of development, implementation and evaluation. For the module's planning one must specify aims and contents as well as the learning environment based on the central professional tasks. At the same time, the framework requirements must be taken into account. It must be clear, which resources are at hand.

The Applied and Innovative learning units consist of the following phases:

- The working process-oriented phases
- The phase of advancement of professional competencies
- The phase of advancement of methodological competencies
- The phase of advancement of social competencies
- The introduction and the balance.

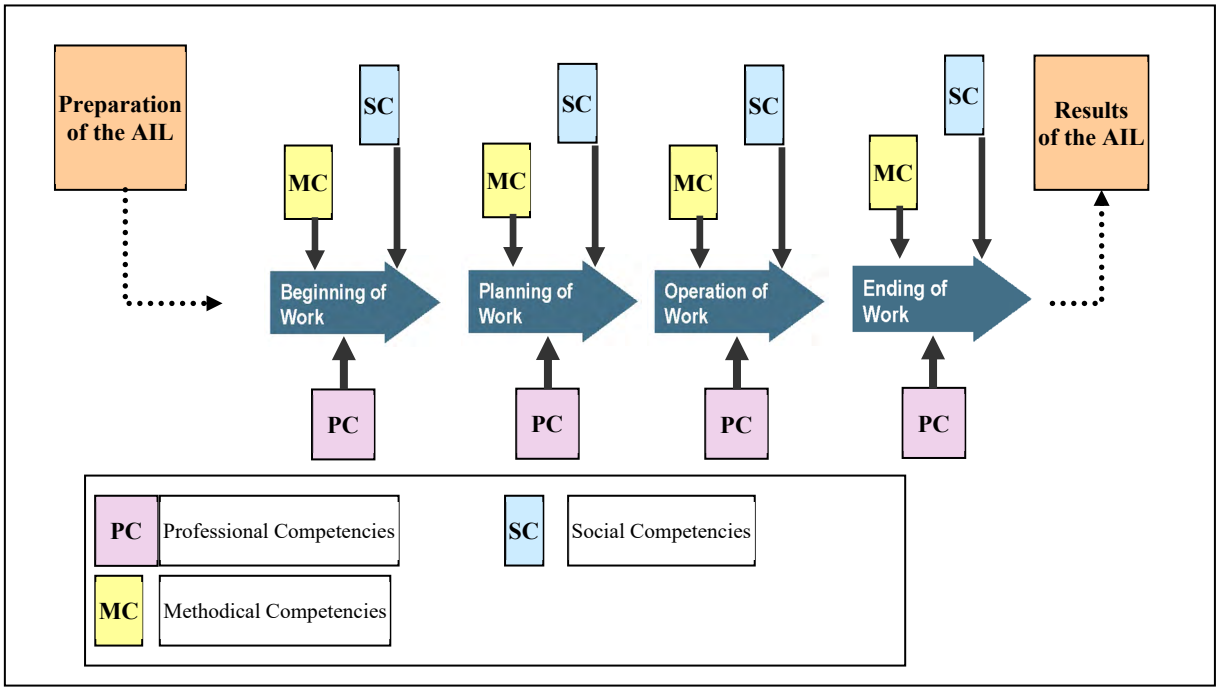


Figure 6 - Planning instrument for Applied and Innovative learning units (AIL)

Basically, the working process-oriented phases of applied and innovative learning units refer to producing a product or to delivering a service, acting on the assignment of tasks.
The working process-oriented phases allow for the consideration of the basic action steps of the working process. At the same time, they provide the framework for an integrated processing of the assignment of tasks including the political, economic, ecologic and social dimensions. The learners shall process the action steps extensively self-dependently. Thereby they shall work as far as possible in different social formations like working alone, with a partner or in a team and gain professional competence.

### Professional Competence

The central point of the interventions is the working process matrix to identify and describe the working-processes of the tasks and work order respectively. For every working process special professional competence is needed to fulfil all work steps of the process. The concept of the intervention is based on a holistic competence model. It is part of an initiative to provide means for higher quality in vocational education.

According to this model, professional competence is described as the ability and willingness to act in vocational situations professionally appropriate, personally elaborated and in social responsibility. This means to solve problems independently and targeted on the basis of knowledge and experience. Own ideas shall be involved in the problem solving. The evaluation of the solutions supports the advancement of the competency.

To specify the professional competence in order to design a working process-oriented training, it is broken down into different fields of competence: technical competence, social competence and methodical competence. Therefore, the profile of competencies is used.

There is a distinction between the use of the terms competence and competency. Competence describes a special area of knowledge including abilities and willingness. Competency covers a special ability to fulfil a task. The profile of competencies is an instrument to define certain competencies of the different fields of competence mentioned above.

**Technical competence**
Technical competence indicates the ability and the willingness to fulfil tasks independently, technically correct and in control of the methods. It also implies the judgement of the task. Reasoning, analysing, abstracting and integrating thinking are needed. Technical competence includes the qualification for a profession containing independent planning, operation and controlling.

**Methodical competence**
Methodical competence indicates the ability and the willingness to develop learning strategies to be able to fulfil tasks. It also implies the use of different techniques, procedures and methods professionally appropriate, targeted and according to the situations. It is predominantly a matter of developing learning and working techniques like planning and organisation as well as research, analysis and use of information; furthermore, it implies control and reflection of the own action as well as structuring, documentation and use of professional experiences.

**Social competence**
Social competence indicates the ability and the willingness to comprehend social relations as well as dealing with others rationally and responsibly. This includes the development of moral concepts like social responsibility and solidarity. Enclosed are also intra-personal competences, i.e. attitudes toward oneself, virtues and motivations affecting one's actions. They are built on self-confidence and self-esteem, on emotional independence and trust into the own abilities.

## 2.1. Timetable

**Intervention 1**

| | |
|---|---|
| 13:00-13:15 | Introduction and Overview about the Applied research Work Process Analysis and competence profiling, intervention structure, aims and results. |
| 13.15-13.45 | Input concept of work processes, spheres of actions, competence profiles and the general holistic structure of German vocations. |
| 13:45-14:00 | Q&A and discussion |
| 14:00-14:15 | Short break |
| 14:15-14:45 | Introduction of applied and innovative research instruments for VET. Results and evaluation examples of Work Process Analysis, Competence Profiles and Applied and Innovative learning units. |
| 14.45-15.00 | Tasks to fulfil for second intervention input / to be continued in Part 2 |

**Intervention 2**

| | |
|---|---|
| 09.00-09.15 | Recap of Part 1. Repetition and Overview about tasks, proposed achievements and perspectives |
| 09.15-09.45 | Presentation of participants results, accumulation of results and achievements.<br>Discussion of outcomes of Work process Analysis and competence profiles |
| 09:45-10:00 | Short break |
| 10.00-10.45 | The Applied Research and Innovation method Expert Validation workshop to enhance learner's curriculum. |
| 10.45-11:00 | Guidelines and Handbook to enhance curricula with applied innovation and research methods. |

## 2.2. Speakers

**Prof. Dr. Henning Klaffke** has been Professor of Applied Computer Science at the Cooperative University of applied Science Hamburg since August 2021. From 2005 to 2021, he taught and researched at the Institute for Technical Education and University Didactics in the field of subject-specific teacher training for vocational schools specialising in media technology and electrical engineering/information technology. In 2014, he completed his doctorate (Dr. rer. pol.) with the thesis "Quality of vocational standards". He graduated in 2004 with the first state examination for the teaching profession at vocational schools in the fields of wood and plastics technology and computer science and completed his vocational training as a cabinetmaker with distinction in 1999. In the years following his doctorate, Dr. Klaffke led many research projects in the field of digitalisation and vocational education and wrote numerous publications in this area. His work focuses on advancing digitalisation and informatisation in various areas while always keeping an eye on vocational education and training. To get in touch about this intervention, you can email him at: henning.klaffke@bhh.hamburg.de.

**Christopher Höhn** has been research assistant at the Cooperative University of Applied Science Hamburg since 2023 and studied political science. He has many years of experience in universities and social research approaches. He supports the research activities in many international projects in different fields of expertise.

## 2.3. Summary

**Strengths**

The strength of this intervention is the development of a practice-oriented approach. This approach shall provide the possibility to apply specialised knowledge to the complex processes in real working situations. Thus, active professional competence is achieved.

Therefore, a new and innovative training course (curriculum) shall be developed and implemented. This intervention shall provide the necessary educational knowledge and competence to the trainers to enable them to design and implement working process-oriented advanced vocational trainings for executives in VET. Innovative and applied research methods can be developed directly at the shop-floor-level.

**Weaknesses**

The persons involved in the training should be experts of their vocational domain in order to guarantee a high and suitable quality. It is a challenge to find those experts and give time to apply this intervention. Regarding the transferability of this intervention, it could be difficult to implement the outcomes of this intervention to existing training units. Therefore, it is necessary to involve the administration of VET Centres to open the curricula for this modern approach which is clearly marked as a bottom-up method to design innovative learning units. For all three units: analysis of the work process, identifying the competence profile and design of the learning units, the access to all documents and to the research field has to be ensured.

**Opportunities**

The concept of the interventions aims to improve the quality of the existing further education measures. This shall be reached via Train-the-Trainer-measures for working process oriented further education. It intends to reorganise existing course concepts to support and promote the transfer of scientific and innovative professional learning content into practical work. There is a great opportunity to foster existing learning units.

**Threats**

Resistance from some learners or institutions to adopt this new bottom-up approach to teaching and learning is a threat. The biggest obstacle, however, is a lack of institutional awareness to implement applied and innovate research as a continuous update process for learning units.

## 3. How to Prepare the Intervention

For the preparation of the intervention is given attention to three different perspectives, the organisational, educational and business perspective.

### 3.1. Organisational Perspective

To organise the intervention, the following key questions are helpful.

**When should you start preparing the intervention?**

- 2 months in advance

**How many people should be involved in the preparation of the intervention?**

- 1- 2 Persons are enough

**From which backgrounds should the people involved come?**

- VET specialist

**What are the key resources you need to provide the workshop?**

- Field access for external domain experts and 2-3 days of time

**How should the "to-do" list look like before the workshop?**

- Set the Date and Venue
- Invite Experts from outside
- Prepare Workshop Materials
- Finalise the Agenda
- Engage Stakeholders
- Develop a Promotion Strategy
- Plan for Feedback Collection
- Confirm Follow-up Actions

### 3.2. Educational perspective

Collaboration between companies and VET teachers is crucial to involve professional experts in a specific vocational domain. The intervention focuses on conducting a gap assessment to identify opportunities for applied research and innovation, with the core task being the application of scientific tools to develop applied and innovative learning units. This approach ensures the integration of research-based methodologies into practical educational frameworks.

### 3.3. Business perspective

An established collaboration network with companies simplifies participation in the intervention. In cases where such a network does not exist, providing incentives may be necessary, particularly when the intervention is organised for the benefit of a VET institution. Companies value the opportunity to access innovative training modules, which are often driven by their operational needs. The intervention offers key benefits by delivering attractive, research-based learning units that enhance workforce skills and align with VET research methods.

## 4. Curriculum for Intervention Workshop

### 4.1. Education Profile

No specific prior education is needed.

### 4.2. Target Group

- Teachers and trainers
- Curriculum developers and instructional designers
- Academic leaders and managers
- Researchers
- Research administrators and managers
- Project officers
- Policy advisors
- Small and medium companies' representatives
- Chambers of Commerce representatives
- Regional development agencies' representatives

### 4.3. Speaker Profile

The speakers should possess a comprehensive understanding of work processes, areas of activity, competency profiles, and the overall structure of the German vocational training system.

### 4.4. Intervention Objectives

- Acquiring knowledge of applied and innovation research methods in collaboration with SMEs.
- Acquiring the ability to understand and apply concepts of work processes, spheres of action, and competence profiles.
- Acquiring the ability to create customised curriculum solutions using research instruments.

### 4.5. Knowledge

- Knows the application of work process analysis to identify innovation of the related Work Process.
- Evaluates the results of the work process analysis to design the competence profile to implement innovation in the learning process.
- Outlines the essential elements for successfully integrating applied research into programme curricula.

### 4.6. Skills

- Adapts the concepts of the applied research method of work process analysis to other topics of institutional training programs.
- Promotes methodological and social competence in the field of vocational training.
- Illustrates practical ways to embed applied research projects into intervention designs, ensuring they enhance student engagement and employability skills.

### 4.7. Competences

- Designs and coordinates applied research projects in collaboration with industry or community partners that align with the content of the intervention.
- Ensures that research projects meet both academic goals and real-world employability competencies.
- Leads the integration of these projects within the course or programme, ensuring seamless collaboration between educational and industry/community partners.

### 4.8. Intervention Content

- Understanding of Applied Research Methods: Exploration of methods within collaborative projects involving SMEs.
- Overview of Ecosystem and Innovation Landscape: Insight into local, regional, and national innovation environments.
- Assessment of Best Practices in Training Development: Evaluation of effective practices in creating training programmes.
- Adapting the BHH Model: Application of the BHH model to various ecosystems.

### 4.9. Teaching Methods

- Activity forms
- Social forms
- Organisation forms
- Application of different media
- Forms of communication
- Control of effects and examinations
- Selection of learning sites
- Determination of times
- Providing and use of material

### 4.10. Literature


- Knutzen, Sönke (2002): Steigerung der Innovationskompetenz des Handwerks. Eine Studie am Beispiel des Installationshandwerks in Hamburg. Zugl.: Hamburg-Harburg, Techn. Univ., Diss., 2001. Bielefeld: Bertelsmann (Berufsbildung, Arbeit und Innovation, 10).
- Knutzen, Sönke; Knauf, Barbara; Dürkop, Axel; Klaffke, Henning; Howe, Falk; Sander, Michael (2015): Kompetenzwerkstatt 2.0 - Entwicklung und Erprobung eines Software-Frameworks für eine arbeitsprozessorientierte Ausbildung. Gemeinsamer Abschlussbericht des Verbundvorhabens: Kompetenz Werkstatt - Mein Beruf : Berichtszeitraum: 01.01.2012-31.12.2014 = Kompetenzwerkstatt 2.0 - Development and testing of a work process oriented software framework in TVET. Hamburg: Institut für Technik Arbeitsprozesse und Berufliche Bildung iTAB Technische Universität Hamburg-Harburg. Online verfügbar unter https://edocs.tib.eu/files/e01fb16/864389795.pdf.
- Pangalos, Joseph (Hg.) (2005): Informatisierung von Arbeit, Technik und Bildung. Eine berufswissenschaftliche Bestandsaufnahme. Münster: LIT (Bildung und Arbeitswelt, 15).
- Howe, Falk; Knutzen, Sönke (2007): Die Kompetenzwerkst@tt. Ein berufswissenschaftliches E-Learning-Konzept. 1. Aufl. Göttingen: Cuvillier.
- https://www.kompetenzwerkstatt.net


## 5. Key indicators

To assess the impact of the intervention, the following KPIs can be monitored.

**Organisational (Interventions)**

- Number of participants
- Number of described work process analysis outcomes
- Number of updated competence profiles
- Number of redesigned learning units

**Educational**

- Assessment of the holistic processing of tasks including the political, economic, ecological and social dimensions.
- Variety of learning forms. The learners should work largely independently and, if possible, in different social forms (individual, partner and group work).
- Assessment of learning outcomes regarding content quality (e.g. work process-oriented phases ensure that the essential steps of the work process are taken into account).
- Implementation of lifelong learning and futures to exiting curricula in the VET centres.

**Business**

- Percentage of training provided by VET centres to SMEs in your region compared to the total number of SMEs.
- Percentage of services for SMEs developed by VET centres in your region compared to the total services used by SMEs.

## 6. Annexes

- Prof. Dr. Henning Klaffke, Intervention 4:  Enhance learners curriculum – Application of work process analysis (WPA) for SME's in house training
- Prof. Dr. Henning Klaffke, Intervention 4: Development of Applied Research action- and working process-oriented learning in the construction sector

# RECOMMENDATIONS

The following AIRinVET project recommendations present a structured, yet non-exhaustive list of interventions designed to strengthen applied research within Vocational Education and Training (VET) systems across Europe. Developed within the framework of the AIRinVET project, these recommendations reflect the project's commitment to fostering innovation and collaboration among VET institutions, SMEs, and broader research ecosystems. They aim to provide actionable insights at both national and European levels, recognising the unique and diverse approaches to applied research across Europe.

The logic behind these recommendations is rooted in the growing recognition that VET institutions are more than training providers—they are pivotal players in regional and local innovation ecosystems. By embedding applied research into national policies, creating supportive ecosystems, and fostering public-private partnerships, these recommendations aim to position VET centres as equal contributors to research and innovation. For example, initiatives like Centres of Vocational Excellence (CoVEs) already demonstrate how dedicated hubs can drive applied research, and these serve as models for broader application.

It is important to note that Vocational Education and Training systems, and thus applied European research is approached in highly diverse ways. Some countries have already embraced many of these recommendations, integrating applied research as a core function of their VET systems and establishing robust funding mechanisms and collaborative frameworks. These ecosystems shall serve as examples of best practices, showcasing the potential impact of these interventions when implemented effectively. Conversely, for other countries, these recommendations may offer a starting point to build the capacity of VET institutions, enhance collaboration with industry, and align research efforts with national and European priorities, such as the Green Deal[1] and Digital Europe strategies[2].

The recommendations highlight key areas such as securing sustainable funding, strengthening institutional capacities, and fostering innovation ecosystems that link education, industry, and policy. They are designed to adapt to the diverse needs and contexts of European countries, offering flexibility while promoting a shared vision for the role of applied research in VET. By addressing challenges and opportunities identified in the AIRinVET project, these interventions aim to enhance the relevance, quality, and impact of VET-applied research across Europe.

## Country-Level Recommendations:

1. **Embed Applied Research in National VET Agendas**
    - **Recommendation**: Encourage national governments to formally recognise the role of applied research as a function within their VET frameworks and policies. Applied research should be integrated into curricula, policies, and national educational strategies ensuring that VET centres and institutions are not seen solely as training providers but also as critical actors in research and innovation in their local or regional ecosystem.
    - **Rationale**: By embedding AR into national policy, VET institutions will have a clearer mandate to engage in research, boosting innovation at local levels.
2. **Facilitate Public-Private Partnerships (PPP)**
    - **Recommendation**: Promote the development of structured public-private partnerships between VET institutions, Universities of Applied Sciences, Small and Medium-sized Enterprises (SMEs) and startups (including Investors, private equity, etc). National governments should facilitate the creation of platforms or networks that bring VET centres and businesses together to collaborate on applied research projects.
    - **Rationale**: SMEs benefit directly from VET-applied research, while VET centres enhance their real-world relevance and improve their curriculum. PPPs will ensure the alignment of research with industry needs.

1. The European Green Deal - European Commission
2. Shaping Europe's digital future | Shaping Europe's digital future

3. **Create national support and recognition for the Centres of Vocational Excellence (CoVEs) and similar initiatives supporting collaborative ecosystems between VET, Universities and business and social partners.**
    - **Recommendation**: Establish and support existing initiatives such as CoVEs as hubs for applied research, innovation, and collaboration between VET centres and businesses. National policy should encourage VET Institutions including CoVEs to act as the main drivers of AR in VET by providing infrastructure and fostering expertise.
    - **Rationale**: CoVEs serve as innovation centres, promoting regional development and excellence in research.
4. **Create Applied Research Ecosystems**
    - **Recommendation**: Encourage the development of local ecosystems that link VET institutions, SMEs, higher education, and research bodies. National governments should invest in coordination bodies that manage these networks, ensuring consistent collaboration and resource-sharing, built from a VET and SME perspective.
    - **Rationale**: A well-connected ecosystem will strengthen applied research by facilitating knowledge transfer and collaboration across sectors to all key actors.
5. **Secure Funding for Applied Research and Capacity Building**
    - **Recommendation**: Secure targeted national funding programmes to support the development of applied research in VET, covering the foundation of research projects and the training of staff involved in research.
    - **Rationale**: Funding is crucial to build capacity for research, ensuring staff have the skills and time to undertake applied research projects.
6. **Investing in the institutional and HR capacity**
    - Provide long-term, stable funding for human resources to guide and support VET applied research activities, develop institutional research capacity, and help secure complementary sources of funding.
    - **Rationale**: Funding for capacity development and support of applied research is important, especially as VET institutions establish and build their research programmes.
7. **Establish National Coordinating Bodies**
    - **Recommendation**: Create national bodies coordinating applied research efforts between VET centres and SMEs. These bodies should serve as contact points for policy, funding opportunities, intellectual property rights and partnership facilitation, which would include private funding, investors and other sources.
    - **Rationale**: Coordinating bodies will streamline communication and collaboration efforts between VET and the private sector.
8. **Broaden the Role of VET Centres**
    - **Recommendation**: Encourage VET institutions to include applied research as a core activity, not merely as an additional function. National qualifications frameworks should reflect the role of VET in research and innovation.
    - **Rationale**: This formal redefinition elevates the status of VET institutions as equal partners in research and development.
9. **Increase Regional Funding for Applied Research Projects**
    - **Recommendation**: National and regional governments should increase funding for applied research in regional development projects, particularly those linked to economic development priorities.
    - **Rationale**: Regional funding ensures that applied research is targeted toward local industry needs, fostering innovation that benefits the local economy.
10. **Debunk the qualification systems to support access to the VET and further education systems for Lifelong Learners**
    - **Recommendation**: Work towards establishing flexible learning pathways, opportunities and permeability between the professional and science-based programmes and further higher education.
    - **Rationale**: Many European countries do not have structured systems allowing learners to choose further study pathways after engaging in the prior education – lack of bridging courses to the higher VET and further education, e.g. level 5 qualifications.

## European-Level Recommendations:

1. **Disseminate Knowledge of Applied Research Context**
   - **Recommendation**: Establish a Europe-wide platform to disseminate knowledge from forward-looking projects on applied research. This platform should include research methods, outcomes, and best practices for VET centres and SMEs to access.
   - **Rationale**: Ensuring that applied research knowledge is easily accessible will empower VET institutions and businesses across Europe to engage in high-quality research, without building up the needed skills and knowledge on research and innovation from scratch.
2. **Link Applied Research in VET to European Policies (Green and Digital Strategies)**
   - **Recommendation**: Integrate applied research in VET into the European Green Deal and Digital Europe policies, ensuring that VET-applied research supports Europe's sustainability and digital transformation goals.
   - **Rationale**: Applied research in VET can play a critical role in addressing skills shortages in green and digital sectors, directly contributing to Europe's broader goals.
3. **Promote Experiential and Work-Based Learning**
   - **Recommendation**: Prioritise experiential and dual learning models across Europe by linking applied research with practical, work-based learning experiences in VET.
   - **Rationale**: Engaging students in applied research will enhance their skills and employability, while also driving innovation for industries and communities.
4. **European Quality Assurance Framework**
   - **Recommendation**: Support the integration of Applied Research relevance for learning and teaching into Recognise applied research in the Quality Assurance (QA) frameworks, especially when the core mission if certain institution missions entail Applied research.
   - **Rationale**: Including applied research in QA frameworks will elevate the importance of research in VET and ensure quality standards across Europe.
5. **Shared Responsibility for Funding**
   - **Recommendation**: On the EU level, advocate for tripartite funding models on where governments, VET centres, and SMEs share responsibility for financing applied research. European institutions should provide guidance on structuring such partnerships. taking into account each of their interests.
   - **Rationale**: Shared funding models distribute the financial burden, making applied research more sustainable.
6. **Long-Term Funding for Applied Research in VET**
   - **Recommendation**: Secure long-term, stable funding streams for applied research in VET through programmes like Horizon Europe and Erasmus+, Interreg, European Regional Development Fund (ERDF) and other programmes. Ensure multi-annual funding commitments to avoid project-based fragmentation.
   - **Rationale**: Stable funding will ensure the continuity of research efforts, making AR a strategic and sustainable part of VET institutions' activities.
7. **Clear Regulation on Intellectual Property (IP)**
   - **Recommendation**: Establish European guidelines for managing Intellectual Property arising from applied research projects between VET centres and SMEs, taking into account each of their interests and allowing for different situations and approaches, with a focus on open access whenever possible and stimulate the establishment of a network of national IP advisory organisations.
   - **Rationale**: Clear IP rules will encourage collaboration by protecting the rights of both VET centres and their business partners while sharing appropriate innovations more broadly through open access.
8. **Pan-European Public Relations Campaign**
   - **Recommendation**: Launch a public relations campaign at both European and national levels to promote the role and relevance of VET education and the applied research in VET. Highlight success stories and the impact of AR on innovation and the labour market.
   - **Rationale**: Raising awareness of AR's value will increase political and societal support for applied research in VET.

9. **Capacity Building for Cooperation Between VET and SMEs (National Recommendation as well)**
    - **Recommendation**: Build capacity in VET institutions to engage in meaningful collaboration with SMEs by providing means for training, tools, and resources for staff involved in research partnerships.
    - **Rationale**: Enhancing the ability of VET institutions to work effectively with businesses will lead to more impactful research outcomes.
10. **Standardise Terminology Across Europe**
    - **Recommendation**: Create a standardised vocabulary for applied research in VET across Europe to ensure a common understanding among stakeholders, as an elaboration of the AIRinVET Glossary. Encourage the use of the AIRinVET framework and roadmap as a standardised approach and blueprint for the development of Applied Research in VET. (On various fora's, policies, guiding documents etc.)
    - **Rationale**: Consistent terminology will facilitate clearer communication and cooperation across borders.

# COLOPHON



**AIRinVET partners:** TKNIKA - Department of education Basque Government, EURASHE, Berufliche Hochschule Hamburg, Hanse Parliament, KATAPULT, ISSO, AFM Cluster for Advanced & Digital Manufacturing and IMH - Advanced and Digital Manufacturing Campus.

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